

ISSUE 35 December/January
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XL/XE

Type-in
TIME TO KILL
REFLEX
BALLBENDER
JUMBLE CELL

FEATURES
CHARACTER ANIMATION
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ST

VIRUSES

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Elementary my dear Jack, just ask the Atari!

L:3 C:06 T:33 S:0000

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5 type-in XL/XE listings!



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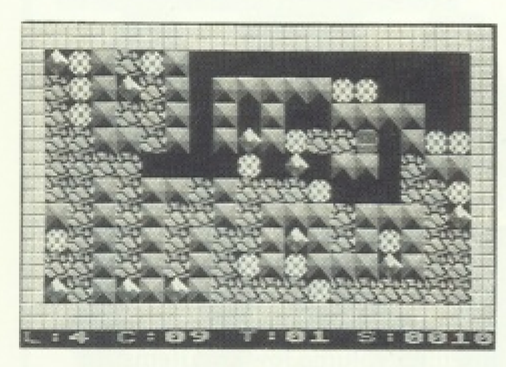
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'The magazine for the Dedicated Atari User'

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ST FILE



MAD
The best type in ST listing of all time?

SUBSCRIPTIONS
Annual subscription rates (6 issues)

UK	£9.00
Europe	£13.50
Elsewhere (sea)	£13.50
Elsewhere (Air)	£21.00

PAGE 6 ON DISK

A disk containing all of the 8-bit programs from each issue of PAGE 6 is available either separately or on subcription. Single price £2.95 per disk, Subscription rates (6 issues)

UK	£24.00
Europe	£30.00
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SUBMISSIONS

PAGE 6 welcomes and encourages its readers to submit, articles, programs and reviews for publication. Programs must be submitted on disk or cassette, articles should wherever possible be submitted as text files on disk. We seek to encourage your participation and do not have strict rules for submissions. If something interests you, write a program or article and submit it! Appropriate payment will be made for all published programs and articles.

The next issue of PAGE 6 will be on sale 26th January 1989. Editorial copy date is 12th December

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Editorial

WELCOME BACK!

Issue 35
December/January 1988

'The Magazine for the Dedicated Atari User'

ISSN No. 0952-4967

THE CREDITS

All of the usual stuff is on page 3 but here are the people who made this issue possible.

Les Ellingham did the editing, layout etc.

Sandy looked after the advertising

Stacey did all those things around the office without which we would not survive (especially making the Editor's coffee!)

Special thanks to **John Barnsley** who did a lot of the peparatory work for this issue.

The Regular Contributors, who provide the backbone of the magazine and can generally be relied upon to come up with good articles and reviews, are ....

Garry Francis
Matthew Jones
John Davison jr
Paul Rixon
Mark Hutchinson
John Davison
John Sweeney
Damon Howarth

All other contributors for this issue are individually credited alongside their articles or programs. Thanks to everybody for sharing their work and enthusiasm with other Atari users.

This issue is dedicated to all those committed readers and contributors who wrote or phoned with encouragement and support when this issue did not appear when it should have done and to all those who were happy to wait. Without your support this issue may never have appeared. Caring about what you produce is, unfortunately, not the way of the world nowadays but Page 6 will carry on caring about Atari in its own unique fashion long after others have lost interest, even if it does have its problems!

Serious? You bet! But Atari is supposed to be fun as well isn't it?

The next issue of PAGE 6 could feature YOUR article or program, so SEND IT IN!

PAGE 6 shows just what you can do with your Atari. With the exception of final output on a Linotron and use of a repro camera for the listings and photos, the magazine is prepared entirely with Atari based equipment and software - not a Macintosh or IBM in sight! Hardware used includes 130XE, 1050 disk drive, 810 disk drive, 410 cassette (occasionally!), 850 Interface, NEC 8023 printer, 1040ST, SM124 Monitor, Atari SH204 hard disk drive, Cumana 1 meg disk drive, Epson RX100 printer, Kyocera laser printer, Microstuffer printer buffer. Software includes Superscript, Turbo Basic, Kermit, PC Intercomm, TARI-TALK, Print Wiz, PC Intercomm, STWriter, Protext and Fleet Street Publisher. Articles and programs submitted on XL/XE disks are subjected to various custom written programs before being transferred across to the ST via TARI-TALK. All major editing is done with Protext and pages are laid out with Fleet Street Publisher. A disk with the finished pages is sent up to The Setting Studio in Newcastle (a typesetting bureau who really know what they are doing with the ST) to be output on a Linotron 300 and, hey presto, finished pages are sent back. It really does work - at last! All that is left is to drop in the listings and photos. Well, it's not quite as easy as that, but you get the idea!

I hope that you are as pleased as we are that the problems experienced in recent months have proved to be only temporary and that PAGE 6 is back on a regular schedule. With a fair wind we should now sail on forever! Regrettably we have had to increase the cover price to £1.50 not least because the cost of paper and printing has gone up three times since we set the previous price! Hopefully it won't hurt too much!

Your letters and calls of encouragement during the troubled times were certainly appreciated, it's nice to know that those Atari owners we started off with almost six years ago, and those who have discovered Atari in recent years are still as dedicated as always. Without your support I may have decided that all the effort was not worthwhile but, fear not, PAGE 6 is here to stay and will continue to bring you the same sort of in-depth coverage that you may not find elsewhere even though this is not the type of thing that brings the mass audience. Judging from the style of many of the successful computer magazines now around it seems that it is not what is said that is important but rather how colourful the pages are and how up to date or ahead the reviews are. It seems that the recipe for success nowadays is to review something that is not yet out, even if it means cribbing the advance packaging notes, and dressing the whole thing up with lots of colour. You will know that the PAGE 6 style is far different, indeed we may review software that is six months old or more, but the crucial difference is that in all of our in-depth reviews the reviewer has played the game for a long time and writes from your point of view rather than that of a journalist. If a game is good enough, it will be around for a long time and we believe that a good review is valid even if everybody else has reviewed the software before. So stick with PAGE 6 for the in-depth stuff, but also let us know what else you would like to see. This issue we have a survey so that you can tell us what it is you would like to see in future issues. I apologise for the waste of a page but we have been putting this survey off for a number of issues and, give the current state of the Atari 8-bit market, I feel that it is important that we discover your feelings. Please take a little time out to complete the survey, it is important.

SUPPORT

Mention of the current state of the 8-bit market brings me on to another matter that needs to be aired and that is the level of support that you give to those companies who are gamely hanging on and producing new 8-bit software. Two such companies are Zeppelin Games and Atlantis software who remain committed to the 8-bit market and release regular titles. Zeppelin, in particular, are to be commended in bringing out Draconus as a full price title in a market dominated by distributors and retailers who are only interested in selling volume low cost items. To introduce a full price Atari range now is a brave step indeed but it shows that there are people who still care about your machine and it is vitally important that, in turn, you let them know that you appreciate their support. We have not been able to review Draconus in time for this issue but if the game is anywhere near the standard of Zybex, then it is likely to be another gem. Seek it out, along with all other new Atari software you can find, buy it if you like it, but don't stop there! If you buy the games direct from the publishers they will know of your interest but if you prefer to buy from your local dealer or a mail order supplier they might never know so why not drop the likes of Zeppelin and Atlantis a line every time you buy one of their games? Tell them that you appreciate their support of your machine and tell them how good (or bad!) you thought the game was, believe me they will appreciate the feedback no end.

With a little time and a second class stamp you can ensure that companies continue to support your machine. Without your feedback these companies may assume that the interest is no longer there and may decide, as many others have done, to go over to other machines and that's not what you want is it? Buy the software and then pick up a pen.

A NEW STYLE

At last the dream appears to have come true! This issue (fingers crossed!) will be produced fully on Atari equipment right from conception to typesetting and layout thanks to a typesetting bureau called The Setting Studio who actually know what they are talking about with regards to the ST and Fleet Street Publisher. What a joy it is to talk to someone in business who actually understands what I am talking about! Desktop Publishing is now part of the 'lifestyle', with dozens of dedicated and expensive systems around. Thousands of people are now copying the notes from their Filofax and producing new 'mags' (entirely DTP you know!) but few have been able to produce work that looks as good as that produced by conventional means. I may be putting my head on the block (since I haven't actually seen the results as I type this!) but it looks as if the cheap and humble Atari ST is the machine that can really produce the results.

PAGE 6 ATARI USER

STOP PRESS ... ... STOP PRESS

A NEW LOOK MAGAZINE TO CONTINUE SUPPORT FOR YOUR 8 BIT ATARI IN THE YEARS AHEAD

Literally in the last couple of days before this issue went to press PAGE 6 completed discussions with Database Publications which resulted in an agreement for PAGE 6 to take over the ATARI USER title and so produce a combined magazine that will continue to provide ongoing support for the Atari XL and XE computers. PAGE 6 readers need have no concern about major changes in the format of the magazine which will continue to support ATARI users in the way it has always done - the best of ATARI USER will be incorporated in PAGE 6 to provide the very best and the ONLY national magazine to support your computer.

Look out for the new PAGE 6 ATARI USER on sale 19th JANUARY

Come and have a chat about our plans at the Atari Christmas Show!

newscene

XL/XE MEANS BUSINESS

Although there are a number of owners who have used their XL/XE systems for business purposes over the years it is probably fair to say that there are far more users who do not realise just how powerful the Atari can be in business applications. Programs such as Synfile and Data Perfect have been available in the past but now there is a fully integrated business package available in this country from Computerhouse.

TURBOBASE has received rave reviews in the States, not least for its compatibility with Data Perfect and Synfile, but it is much more that just another database. Turbobase features *three* relational databases, a word processor, spreadsheet, full accounts system, report generator, invoicing, inventory/stock control, payroll, a flexible mailing system and more and is available in both 40 column and 80 column versions. Sounds too good to be true but the product was awarded an 'Outstanding Product' award by ANTIC magazine and has received excellent reviews in that magazine and others, one calling it 'the most powerful business package for any 8-bit computer, including the 8-bit IBMs'. The program comes with a 700 page manual including a Quick course and Cookbook and must surely be considered for any small businessman who owns an Atari XL or XE.

The 40 column version retails at £119 and the 80 column at £129. Congratulations must got to Computerhouse for having the enterprise to make this type of software available and we are sure that they will be happy to provide you with further information or answer any questions. Computerhouse can be contacted at 14, Romily Court, Landridge Road, Fulham, London SW6 4LL. Their telephone number is 01 731 1276.



THAT'S A JOYSTICK?

For the very first time, a joystick you can hang your coat on! If you turn the picture sideways you will get a glimpse of one of the new generation of futuristic joysticks from Konix called the Navigator. Konix claim that is the best joystick they have ever produced. First conceived over two years ago, the Navigator is suitable for left or right handed players and uses microswitches similar to the popular Speed King. It also features Autofire and Konix claim that it will pass every conceivable waggle test. If you want one it will set you back £14.99 which isn't bad, as a designer coat hook would cost you at least twice that!

ATARI COMES TO GREENDALE



Now here's a piece of software that will have a lot of small Atari owners jumping up and down and fighting mum and dad for the computer! Alternative Software have secured the license to the popular Postman Pat and have announced that an Atari 8 bit version will be released, hopefully in time for Christmas. Alternative say that they will produce a game that will appeal to all age groups as, in addition to the younger person's option, the game has been written in such a way that it can be treated as a serious game for adults. True family games on the Atari have been few and far between and this could well become a family favourite.

WATCH TV!

Remember the TV commercials last year for the ST? Well this Christmas Atari promise, in addition to the ST advertising, a £400,000 TV campaign for XE games system and the VCS. Note the words 'games system' for the commercials are unlikely to promote the XE in the way that most PAGE 6 users will know that it can be used, but the mere mention of the XE computers must be a benefit, particularly as the software is identical. Besides creating public awareness, publicity of this sort encourages software houses to keep supporting the machine and that can only be of benefit to every Atari user.

ZEPPELIN FLYING HIGH

Flushed with the success of their budget label, Zeppelin games have launched a new full price label the first title will be for the Atari 8 bit.

DRACONUS is the name of the game and it promises to be a blockbuster with a great deal of time and effort having gone into programming the Atari version. Asked why Zeppelin were launching a full price label, Derek Brewster stated that "With all the money spent on converting the title to the Atari, it would be totally uneconomic to sell it a budget price". Draconus will be a top selling game for the Atari over Christmas, why wait for the review, on the strength of ZYBEX - one of the best Atari games in many a year, you can trust Zeppelin and go and buy it anyway!

A NEW RANGE OF XL/XE SOFTWARE?

Any Atari 8 bit owner who went along to the PC Show in September would have been sorely disappointed but amongst the millions of bits of paper lying around was a very interesting leaflet from KEYPUNCH Software. Included in the range was a number of XL/XE titles, none of which appear to have been released over here before. The list includes Gambler, Run For The Money, Strategy Simulations, Adventure Pak, Space Games, Arcade II, Greatest Hits, Fun in Learning, Fun in Numbers, Mind Mazes, Money Tools, Dungeons of Despair, Sports Spectacular, Arcade Bonanza and Action Adventures.

All of the titles retail at £5.99 although we are not sure whether they are disk or cassette, at the time of writing we have not been able to get any further details of the software. Keypunch are an American company and the UK order address is Keypunch Software Ltd., P.O. Box 874, London, N21 3JJ. We will try and bring you more details of what could be an interesting addition to the ever decreasing range of new titles for the 8 bit. In the meantime why not drop Keypunch a line to express your interest and let them know that we are all interested in knowing about new software for the Atari 8 bit.

JINXTER

Reviewed by John Sweeney

In the beginning was The Pawn ... which turned out to be a reasonable adventure, but with quite a few flaws and nothing like as good as it was claimed to be. They say you learn by your mistakes, and, fortunately for all us adventurers, Magnetic Scrolls seem to have done just that! Their second game, The Guild of Thieves, was excellent and so is their latest offering - Jinxter.

You know you are in for lots of fun when you boot the game and instead of the usual boring copyright notice you get: "Version 1.0. And a jolly good version it is too. All rights reserved. We really mean it. No messing!". The game is packed full of humour - just try examining a wall or the path in the garden - the responses are superb! There are also some nice little references to other adventures - dogs eating microscopic space fleets and mailboxes coming to life! You will meet some very strange characters, especially the Guardian who recruits you to do a little job for him, to be precise he co-opts you as Special Consultant to the Investigative Sub-Committee of the Interdepartmental Steering Committee of the Working Group of the Standing Committee on Administrative Administration and Internal Affairs to:

* Locate five missing enchanted Charms
* Gain access to the enchanted Bracelet of Turani
* Reassemble the Charms on to the Bracelet
* Utilise the power of the Bracelet against the Green Witches

Unfortunately, the Green Witches have bribed members of the public to conceal the Charms (so don't expect a lot of help from the locals!) and the Bracelet seems to have disappeared completely.

Jinxter is basically a straight forward text adventure, with Magnetic Scrolls' usual high quality pictures - great if you like that sort of thing - but personally I turn off the pictures fairly early in order to speed up responses and make more room on the screen for text. I usually turn them on again once I have solved the puzzles, then just run through all the locations to have a look at the pictures, certainly some of them on the ST are very impressive. There are some extra commands to vary the picture presentation on an ST Mono screen, but I haven't seen the results. The ST also has a TEXTSIZE command so that you can choose small characters for a monitor or large characters for a TV.

Other useful facilities include the ability to edit your input, recall the last command, and (on the ST) define a function key as a command (e.g. make F1 mean GET ALL). Lots of abbreviations make most of the common commands very easy to input, including Z for WAIT which failed to get into the documentation!

The packaging is excellent and includes comprehensive coded hints in case you get stuck, and there is certainly plenty of opportunity for that! The game starts off fairly sequentially as you find your way to your own house, then past various dangers such as wild bulls and barbed wire to your friend Xam's house. There you find the Lagoon and a major problem of how to cross it - it's too cold to swim, the boat is rotted and the canoe is holed!

Once across the lagoon the game opens up a bit as you now have a whole village to explore - post office, pub, bakery, clockmaker and the beautiful carousel illustrated on the box cover. There are lots of interesting puzzles to solve as you search for the missing charms, however by now you should have acquired a couple of them and these are pretty powerful magic in their own right - allowing you to cast spells such as Freeze and Animate. The Guardians are not very good at remembering words so the charms (and indeed anything the Guardians talk about) tend to be referred to as doodahs, thingys, oojimys, watchercallits and doofers. All you have to do is "find the wossname, say the doodah, and thing's your wossname. Charm. Word. Bob. Uncle. Narmean?"

Despite his failings in the memory department your own personal Guardian is excellent at his job, i.e. guarding you! He appears whenever you are in danger of dying and ensures your survival, usually in an entertaining manner, thus avoiding all those boring deaths and RESTOREs prevalent in so many other games. He also often appears when you are stuck and offers the odd hint, especially if prompted with the right question, assuming you can actually get his attention away from his obsession with cheese sandwiches!

The latter parts of the game are also a little bit sequential as you finally locate the bracelet and attempt to defeat Ms Jannedor Nasty, 186 who is behind all your troubles, but finding the correct route is not easy - there are lots of red herrings, and lots of opportunities to miss something along the way. Some things you only get one chance at, so if you are really stuck it is well worth playing the game through from the beginning again in case you can spot something you missed or ways to interact with any of the strange events that occur throughout the game!

As far as playability is concerned I found Jinxter a lot less frustrating than Magnetic Scroll's previous offerings in terms of getting it to understand my input. I found a few minor niggles and inconsistencies but nothing enough to detract seriously from the game - just beware if a match blows out - get rid of it - the game has great difficulty working out which match you are referring to next time you try and light one! My only real disappointment was in the final defeat of Jannedor and the subsequent events. Even in retrospect I don't see why casting that particular spell in that way at just the right time should have that effect, or how you are supposed to work out that you should try it - even though the result lets you know you are on the right track and, amusing as the ending is, it was still a trifle too obscure for me!

Nonetheless Jinxter is an excellent game for all fun-loving, puzzle fiends. It hangs together well, has lots of great atmosphere and humour, and is thoroughly recommended for the ST where its sub-second response times make it extremely playable. Unfortunately on the XL/XE the response times are similar to those in The Guild of Thieves - 30 seconds average until you turn off the pictures, and even then the response times fluctuate wildly from 4 to 20 seconds, often around 10 to 12, but with frequent 20s. I found this made the game almost unplayable at times - if you type a few commands into the key-ahead buffer you can get some very long waits! (It would also help if they made the buffer bigger - it certainly isn't adequate at the moment!) There are plenty of equally good games from other companies without this frustration, but if you want to play Jinxter on your 8-bit machine then we should at least be thankful that Magnetic Scrolls are still supporting the good old machines.

The next one from Magnetic Scrolls is apparently quite a different type of game - "Corruption" - deceit and intrigue in the world of High Finance - but as long as they keep up this kind of quality I'm sure we won't be disappointed!

Available for both Atari XL/XE and ST
Published by Magnetic Scrolls/Rainbird
ST version - £24.95
800/130XL(sic) version - £19.95
requires 1050 Disk Drive

HOW TO TYPE IN THE LISTINGS
and get them right!

The program listings in PAGE 6 are prepared carefully to ensure that they can be typed in as easily as possible. Before typing any listings ensure that you are familiar with the use of the Shift and CONTROL and INVERSE keys as outlined in your computer manual. The listings are prepared to match exactly what you see on screen. Every character that you may see in a listing is included in the chart below for cross reference. By using TYPO 3 you can ensure that you type in the programs EXACTLY as they are printed. Remember, a single typing mistake may mean a program will not run.

WHAT ARE THOSE CODES?

Each line of a program printed in PAGE 6 begins with a special two letter code. THESE SHOULD NOT BE TYPED IN. They are used by the program TYPO to check that you have typed each line correctly. IF YOU HAVE NOT ALREADY TYPED IN THE TYPO 3 LISTING PLEASE DO SO NOW. The program can be used as you type in each line of a program or to check an already typed program. The code for each line will match but if you have problems check the listing conventions below carefully, you are most probably typing a CONTROL character incorrectly. TYPO 3 cannot check whether a line has been missed so if you have problems in running a listing count the lines in the program and ensure none are missing. If the TYPO codes match and the program still does not run, LIST it to cassette or disk using LIST "C:" or LIST "D:filename", switch off the computer, re-boot and then ENTER the program using ENTER "C:" or ENTER "D:filename". Save this version in the normal way.

HOW TO USE TYPO 3

1. Type in the listing carefully for although you can use TYPO 3 to check itself (see 6 below) it may not work if you have made mistakes.
2. SAVE or CSAVE a copy of the program.
3. Each time you want to type in a program listing RUN TYPO 3 first. The program will install a machine code routine in memory and then delete itself. Now type in a line as shown in the magazine *excluding the first two letter code* and press RETURN.
4. A two letter code will appear at the top left of your screen. If this code matches the one in the magazine carry on and type the next line. Note, the code will not match if you use abbreviations. If you prefer to use abbreviations LIST the line you have just typed, move the cursor to that line and press RETURN. The code should now match.
5. If the code does not match, use the editing keys to correct the line and press RETURN again. Repeat if necessary until the codes match.
6. To check a line you have already typed LIST the line, place the cursor on that line and press RETURN.
7. When you have finished a listing just SAVE or CSAVE it in the normal way.

You can type in a program without using TYPO 3 and then check it by SAVEing or CSAVEing a copy of the program, running TYPO 3 and then LOADing or CLOADing your program and proceeding as in step 6 above.

Always SAVE or CSAVE a program before running it and always use TYPO before telling us that a program will not run.

OUR UNIQUE LINE BY LINE CHECKER WORKS ON ALL ATARI XL/XE and earlier 8-bit machines

```
EI 1 REM ******************************
AL 2 REM *  TYPO III by Alec Benson    *
         *           June 1985         *
SA 3 REM * A proofreader for ANTIC and *
         *   PAGE 6 based on TYPO II   *
         * published by ANTIC magazine *
EL 4 REM ******************************
SG 100 GRAPHICS 0
WG 110 FOR I=1536 TO 1791:READ A:CK=CK+A:
   POKE I,A:NEXT I
CG 120 IF CK<>30765 THEN ? "Error in DATA
    statements - Check Typing":END
YM 130 A=USR(1536)
VT 140 ? :? "TYPO III is up and running":
   NEW
MA 1000 DATA 104,160,0,185,26,3,201,69
HG 1010 DATA 240,8,200,200,200,192,36,208
QB 1020 DATA 242,96,200,169,79,153,26,3
RK 1030 DATA 200,169,6,153,26,3,162,0
RR 1040 DATA 189,0,228,157,79,6,232,224
TO 1050 DATA 15,208,245,169,93,141,83,6
KC 1060 DATA 169,6,141,84,6,173,4,228
EU 1070 DATA 105,0,141,95,6,173,5,228
BK 1080 DATA 105,0,141,96,6,169,0,162
KK 1090 DATA 3,149,203,202,16,251,96,0
ZR 1100 DATA 0,0,0,0,0,0,0,0
LD 1110 DATA 0,0,0,0,0,0,32,94
JM 1120 DATA 6,8,72,201,155,240,55,230
TV 1130 DATA 203,133,209,138,72,169,0,133
TW 1140 DATA 208,162,8,10,38,208,6,209
MF 1150 DATA 144,7,24,101,203,144,2,230
RL 1160 DATA 208,202,208,239,133,207,24,1
   65
TM 1170 DATA 204,101,207,133,204,165,205,
   101
AW 1180 DATA 208,133,205,165,206,105,0,13
   3
XH 1190 DATA 206,104,170,104,40,96,138,72
NR 1200 DATA 152,72,162,0,134,207,134,208
GF 1210 DATA 160,24,6,204,38,205,38,206
EA 1220 DATA 38,207,38,208,56,165,207,233
TM 1230 DATA 164,170,165,208,233,2,144,4
SK 1240 DATA 134,207,133,208,136,208,227,
   162
CB 1250 DATA 8,165,207,133,204,165,208,6
XN 1260 DATA 204,42,201,26,144,4,233,26
MB 1270 DATA 230,204,202,208,242,133,205,
   169
BC 1280 DATA 128,145,88,200,192,40,208,24
   9
WV 1290 DATA 165,204,105,160,160,3,145,88
QA 1300 DATA 165,205,24,105,161,200,145,8
   8
MQ 1310 DATA 32,69,6,104,168,76,153,6
```

Normal	Inverse	Shift	Inverse Shift	Control	Inverse Control
1		!			
2		"			
3		#			
4		$			
5		%			
6		&			
7		'			
8		@			
9		(			
0		)			
<					
>					
a		A			
b		B			
c		C			
d		D			
e		E			
f		F		/	
g		G		\	
h		H			
i		I			
j		J			
k		K			
l		L			
m		M			
n		N			
o		O			
p		P			
q		Q			
r		R			
s		S		+	
t		T			
u		U			
v		V			
w		W			
x		X			
y		Y			
z		Z			
-		_			
=		|			
;		:			
+		\			
*		^			
,		[			
.		]			
/		?			

■ INVERSE SPACE

Other codes

␛	ESC ESC
↑	ESC CTRL -
↓	ESC CTRL =
←	ESC CTRL +
→	ESC CTRL *
↖	ESC SHIFT CLEAR
◀	ESC DELETE
▶	ESC TAB
	ESC SHIFT DELETE
	ESC SHIFT INSERT
	ESC CTRL TAB
	ESC SHIFT TAB
	ESC CTRL 2
	ESC CTRL DELETE
	ESC CTRL INSERT

TIME TO

If you like solving Agatha Christie murder mysteries then this gripping adventure game was created for you for that is just what the idea is based on. It has the usual theme - a brutal murder has been committed in a stately, residential hotel, each guest seems to have a good motive for the crime, and you take on the role of detective, your task being to question each suspect and look for clues. You must use your powers of deduction to identify:

The murderer
The weapon or method used
The motive

At the end of the game your rating as a detective will be assessed as a percentage. Every question you ask costs points and making the wrong accusations will also lose you points, more so if you incriminate the wrong person! As you play the game you'll find that the characters in this drama are ordinary people with ordinary jobs, hobbies and personal characteristics, but each individual is different and, as in real life drama, it is these differences (or similarities) which cause friction and provoke criminal intent. They have personalities, too, some good, some bad, and you will soon begin to identify them as real people but be careful not to jump to conclusions. At the same time you will not score highly if you ask unnecessary questions. Choose your questions selectively based on the information you have, for example if the clues suggest that the murderer is a woman then it would be pointless questioning the men unless you find evidence to the contrary. The people have feelings, too, and what's more ten of the eleven are innocent and they won't be too pleased if you keep knocking on their door so keep your visits to a minimum or you'll lose points.

At the heart of the program is a complex routine equipping the computer with a simulated human intelligence which enables it to understand how people's characteristics conflict. It assesses the nature of the ill-feeling that would result and classifies it into one of four categories which constitute the four principal motives for murder:

1. A fierce argument.
2. Ill-feeling, grudge or revenge.
3. Robbery.
4. Sex-related such as infidelity or promiscuity.

MOTIVES FOR MURDER

Argument motive is affected by - *financial problems - poverty, people living together, car-parking disputes. People with pets or noisy hobbies are provocative to those who haven't. Also their personality - hot-tempered, cruel, brave, noisy, selfish or bossy.*

Grudge motive is affected by - *wealth, smoking and house-pets - in each case the have-nots have a grudge against the haves. Also persistent noisy hobbies and people who are jealous, noisy, bossy, selfish, hot-tempered, slanderous, promiscuous, immoral or cruel especially people of the same sex.*

Robbery motive is affected by - *the difference in people's financial or material wealth. Also personality - brave, dishonest, greedy, materialistic, boastful and strong but note that people are reluctant to rob someone who is strong.*

Sex motive is affected by - *personality - promiscuous, immoral, greedy, dishonest, boastful and jealous. Members of the same sex due to their partner's infidelity or 'two-into-one' situations. People of opposite sex but not sharing the same room - promiscuity.*

HOW THE GAME WORKS

A victim is chosen at random, then the computer compares his (I will use the word 'his' for convenience) character profile with the profiles of the eleven other guests. By means of its artificial intelligence the computer then evaluates, on a points system, each suspect's murder potential. The suspect with the greatest potential is naturally chosen to be the murderer. Normally he will appear to have more than one motive in which case the computer selects the one with the highest potential. When playing the game you virtually have to make the same comparison and assessment except that the computer helps you by leaving clues. These may help to identify the killer's sex, job, hobby and characteristics. Usually five clues are found at the murder scene but one of these may be a red herring. Sometimes the murderer himself will provide an extra clue but this will always be bogus to try to put you off the scent. If less than five clues are found then that's because there are none to leave. For example if the murderer smokes then he may leave a fag-end, if not then no such clue will be left, so shortage of clues is a clue in itself - he may be a non-smoker. There are two other possibilities. The weapon or method used will be something connected with the murderer's job or hobby but the butler has access to the hotel's master keys and may 'borrow' anyone's weapon while they are out. One of the female guests, by virtue of her job, may be invited into the victim's room and so may use one of the victim's own weapons. The killer may use one of his room-mate's weapons - please remember! The location of the body could be significant. For example in the hotel bar a murderer would have the perfect opportunity to slip something into someone's drink.

The game is played throughout using the joystick in port one. To question suspects move the detective to the left of them and push the joystick to the right. To ask questions move the cursor to the appropriate question and press fire. No keyboard typing is necessary. Your enquiries are automatically stored in a file which is kept on a table in the dining-room - your temporary investigation headquarters. You may consult your files at any time and no points are deducted. After electing to charge you cannot refer to your files so you must either memorise or write down all the relevant information you may need for your accusations.

HINTS FOR PLAYING THE GAME

This adventure game will test whether you have a brain or not and before too long you will no doubt earn the nickname 'The Pandora Ponderer'. Fortunately the unknown quantities in this game are vaguely familiar. We have a fair idea of what lethal implement someone would use if they worked as a hairdresser or whose hobby was sculpting, but some are less obvious. Someone involved with gambling or sport might choose a method with an

KILL

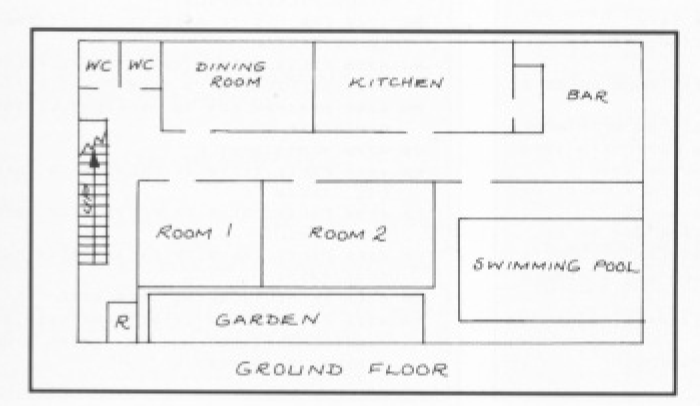
by Gregory Francis Benham

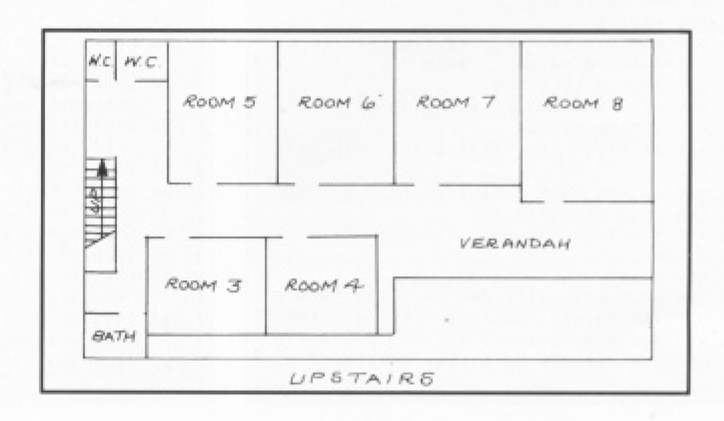
element of risk or uncertainty. A woman might use a more deceitful, less physical, method. Similarly with clues, some are not so obvious. Two particularly obvious clues would distinguish the sex of the murderer except that the dressmaker is likely to possess both. Three guests have dirty gear that they keep in lockers under the stairs and of course the butler also has keys. Also the size of the varnish brush is not described - it may be part of a manicure set. And the magician is likely to have anything up his sleeve.

Trying to identify the motive will present the biggest problem. The computer's brain isn't large enough to teach him all the elements of human psychology but he can cope with the four major basic principles shown in Table 1. In all four cases there are certain good personality traits, e.g. honesty, which reduce people's potential in that particular category and people with similar hobbies generally get on well together. Finally, since the victim is chosen at random, sometimes he will have a greater motive for killing the murderer than vice-versa. In this case the computer selects this as the murderer's motive though it is really more of an instigating factor. It can be regarded as a criminal act that back-fired on the victim, e.g. rich person kills poor person - motive 'robbery'. Since each person's profile is assembled at random it is unlikely that the same identical character will appear twice. Every time you play the game you'll meet a completely different set of characters. Perhaps one day you'll come across a carbon-copy of yourself - hope you've got a good lawyer!!

```
AE 10 REM ******************************
JI 20 REM *        TIME TO KILL        *
EK 30 REM *             by             *
SI 40 REM *      GREGORY BENHAM        *
OW 50 REM *----------------------------*
VT 60 REM * PAGE 6 MAGAZINE - ENGLAND *
AK 70 REM ******************************
BF 80 REM
IZ 100 ? CHR$(125);"TIME TO KILL - by Gre
   g Benham":? :? "Please wait 2 mins":CL
   R :PTS=2000:GOSUB 4000
OO 110 FOR I=0 TO 30:SOUND 0,I,10,15-I/2:
   SOUND 1,I+2,10,15-I/2:SOUND 2,30-I,10,
   15-I/2:NEXT I:POKE 559,34
ID 120 OX=723:OY=763:X1=0:Y1=0:OX1=0:OY1=
   0:F=1
SA 130 X=OX:Y=OY:IF F=1 THEN POKE 560,0:P
   OKE 89,MTOP-9
AM 140 IF F=2 THEN POKE 560,32:POKE 89,MT
   OP-15
YG 150 SCR=PEEK(88)+PEEK(89)*256:GOSUB 33
   0
NW 160 ST=STICK(0):IF ST=15 THEN 160
KL 170 X=OX+(ST=7)-(ST=11)+(ST=13)*40-(ST
   =14)*40:IF X>919 THEN X=X-40
RG 180 Y=X+40
KI 190 IF X=361 OR X=362 THEN GOSUB 320:X
   =X+(ST=13)*40-(ST=14)*40:Y=X+40:OX=X:O
   Y=Y:F=(F=1)*2+(F=2):GOTO 130
LW 200 IF ST=14 THEN X1=PEEK(SCR+X):GOTO
   280
CP 210 IF ST=13 THEN Y1=PEEK(SCR+Y):GOTO
   300
EE 220 IF ST<>7 AND ST<>11 THEN 370
KL 230 X1=PEEK(SCR+X):Y1=PEEK(SCR+Y)
CE 240 IF (X1=0 AND Y1=0) OR (X1=128 AND
   Y1=128) OR (X1=4 AND Y1=4) OR (X1=5 AN
   D Y1=5) THEN GOSUB 320:GOTO 340
YY 250 IF ST=7 AND (X1=8 OR X1=10) THEN G
   OSUB 380:GOSUB 400:GOTO 130
MF 260 IF Y1=14 THEN GOSUB 380:K=19:GOSUB
    800:GOTO 130
NM 270 X=OX:Y=OY:X1=OX1:Y1=OY1:GOTO 160
DU 280 IF X1=0 OR X1=128 OR X1=4 OR X1=5
   THEN GOSUB 320:GOSUB 330:Y1=OX1:GOTO 3
   60
EL 290 X=OX:X1=OX1:GOTO 160
GP 300 IF Y1=0 OR Y1=128 OR Y1=4 OR Y1=5
   THEN GOSUB 320:GOSUB 330:X1=OY1:GOTO 3
   60
EU 310 X=OX:Y1=OY1:GOTO 160
QM 320 POKE SCR+OX,OX1:POKE SCR+OY,OY1:RE
   TURN
VR 330 POKE SCR+X,6:POKE SCR+Y,7:RETURN
GE 340 IF ST=7 THEN POKE SCR+X,26:POKE SC
   R+Y,27:GOTO 360
LI 350 POKE SCR+X,28:POKE SCR+Y,29
CK 360 SOUND 0,90,10,15:SOUND 0,0,0,0
JX 370 OX=X:OY=Y:OX1=X1:OY1=Y1:GOTO 160
NZ 380 POKE SCR+X,X1:POKE SCR+Y,Y1:X1=OX1
   :Y1=OY1:RETURN
JY 400 J=X-(INT(X/40)*40)-1:IF F=1 THEN R
   =(J=9)+(J=17)*2:GOTO 420
FW 410 R=(J=9)*3+(J=17)*4+(J=11)*5+(J=19)
   *6+(J=27)*7+(J=35)*8
TX 415 IF R=0 THEN R=FIL(VIC,1)
YH 420 FOR I=1 TO 12:IF FIL(I,1)=R THEN S
   =I:POP :GOTO 440
GA 430 NEXT I
MP 440 C=3:A=3:K=14:L=65:GRAPHICS 0:POKE
   712,148:POKE 82,0:? "▸PANDORA HOTEL
   ROOM ";R:?
PS 445 IF S=VIC THEN S=S+1:FIL(S,12)=0
TQ 450 ? "▸Suspect ";:IF S>VIC THEN ? S-1
   ;:GOTO 460
ZD 455 ? S;
```

Continued overleaf





Time to Kill

```
RB 460 RESTORE 5250:J=FIL(5,39):FOR I=1 T
   O J:READ DAT$:NEXT I:? "   ";DAT$;
KJ 465 RESTORE 5230:J=FIL(5,40):FOR I=1 T
   O J:READ DAT$:NEXT I:? " ";DAT$
YN 470 FOR I=4 TO 14:IF I=13 THEN I=I+1
WU 480 POSITION 0,I:? CHR$(L);:L=L+1:GOSU
   B 576+I:NEXT I
UE 490 POSITION 0,C-1:? CHR$(29);
KG 500 FOR D=1 TO 10:NEXT D:IF STICK(0)=1
   3 AND C<>K THEN C=C+1:? CHR$(29);
LK 510 IF STICK(0)=14 AND C<>A THEN C=C-1
   :? CHR$(28);
JA 520 POKE 77,0:IF STRIG(0)=1 THEN 500
OD 530 LOCATE 0,C,L:L=L-128*SGN(L-127)
TN 540 IF L<65 THEN 490
OP 550 IF L>64 AND L<74 THEN L=L-65:POKE
   752,1:GOSUB 600+L*10:POKE 752,0:PTS=PT
   S-10:GOTO 490
AZ 560 IF FIL(S,12)=1 AND OTH=0 THEN S=S+
   1:OTH=1:GOTO 440
AY 570 ? CHR$(125):OTH=0:GOSUB 700:RETURN
GA 580 ? " Do you have a job?":RETURN
YC 581 ? " What's your hobby?":RETURN
HD 582 ? " Are you wealthy?":RETURN
CQ 583 ? " Do you have a car?":RETURN
XS 584 ? " Do you smoke?":RETURN
TW 585 ? " Any house-pets?":RETURN
IZ 586 ? " Describe yourself":RETURN
PW 587 ? " Anything else?":RETURN
RB 588 ? " Has anything found":? "  at th
   e murder scene?":RETURN
NP 590 ? " No further questions.":RETURN
CP 600 J=FIL(S,3):FIL(S,30)=J:RESTORE 509
   9+J:READ DAT$:POSITION 23,4:? DAT$;:RE
   TURN
KH 610 J=FIL(S,4):FIL(S,31)=J:RESTORE 511
   1+J:READ DAT$:POSITION 23,5:? DAT$;:RE
   TURN
PF 620 J=FIL(S,7):FIL(S,32)=J:RESTORE 522
   0:FOR I=1 TO J:READ DAT$:NEXT I:POSITI
   ON 23,6:? DAT$;:RETURN
TW 630 J=FIL(S,8):FIL(S,33)=J:RESTORE 522
   0:FOR I=1 TO J:READ DAT$:NEXT I:POSITI
   ON 23,7:? DAT$;:RETURN
YN 640 J=FIL(S,9):FIL(S,34)=J:RESTORE 522
   0:FOR I=1 TO J:READ DAT$:NEXT I:POSITI
   ON 23,8:? DAT$;:RETURN
ZV 650 J=FIL(S,10):FIL(S,35)=J:RESTORE 52
   20:FOR I=1 TO J:READ DAT$:NEXT I:POSIT
   ION 23,9:? DAT$;:RETURN
UO 660 J=FIL(S,5):FIL(S,36)=J:RESTORE 518
   0:FOR I=1 TO J:READ DAT$,D,E:NEXT I:PO
   SITION 23,10:? DAT$;:RETURN
ZK 670 J=FIL(S,6):FIL(S,37)=J:RESTORE 518
   0:FOR I=1 TO J:READ DAT$,D,E:NEXT I:PO
   SITION 23,11:? DAT$;:RETURN
IA 680 J=FIL(S,11):FIL(S,38)=J:POSITION 2
   3,13:IF J=0 THEN ? "I don't know.":RET
   URN
SR 690 RESTORE 5150:FOR I=1 TO J:READ DAT
   $:NEXT I:? DAT$;:RETURN
VA 700 POKE 710,10:POKE 711,136:POKE 712,
   66:POKE 756,CS/256:? CHR$(125):POKE 56
   1,6:POKE 88,0:RETURN
AS 800 GRAPHICS 0:POKE 712,148:POKE 82,0:
   ? :? "P A N D O R A   M U R D E R   F
   I L E S"
MP 810 POSITION 14,4:? "Select- then":POS
   ITION 14,5:? "press  fire:"
GQ 820 C=6:A=6:FOR I=1 TO 8:POSITION 14,I
   +6:? I;" for Room ";I:NEXT I
IZ 830 POSITION 14,15:? "9 for Victim":?
   :? ,"    E exit room":? :? ,"    C to
   CHARGE"
FO 840 POSITION 14,C-1:? CHR$(29);
KT 850 FOR D=1 TO 10:NEXT D:IF STICK(0)=1
   3 AND C<>K THEN C=C+1:? CHR$(29);
LK 860 IF STICK(0)=14 AND C<>A THEN C=C-1
   :? CHR$(28);
EE 870 IF STRIG(0)=1 THEN 850
AF 880 LOCATE 14,C,L:L=L-128*SGN(L-127):L
   =L-48:IF L<1 THEN 840
GS 890 IF L=21 THEN GOSUB 700:RETURN
ZB 900 IF L=19 THEN 1200
HL 910 GOSUB 920:GOTO 800
ZH 920 FOR I=1 TO 12:IF FIL(I,1)=L THEN S
   =I:POP :GOTO 930
GS 925 NEXT I
FM 930 GRAPHICS 0:POKE 712,148:POKE 82,0:
   ? "}PANDORA HOTEL    ROOM ";
FP 935 IF L=9 THEN 950
ZE 940 IF S=VIC AND FIL(S,12)=0 OR FIL(S,
   12)=2 THEN RETURN
JK 945 IF S=VIC AND FIL(S,12)=1 THEN S=S+
   1
QQ 950 IF L=9 THEN ? FIL(VIC,1):? :? "Vic
   tim ";:S=VIC:GOTO 980
TH 955 ? L:? :? "Suspect ";S-(S>VIC);:GOT
   O 970
YV 960 ? S;
UR 970 IF FIL(S,12)=1 AND S+1<>VIC THEN P
   OSITION 20,2:? "Suspect ";S+1-(S>VIC)
JE 980 FOR I=0 TO 1:J=4:V=FIL(S,39):RESTO
   RE 5250:FOR N=1 TO V:READ DAT$:NEXT N:
   GOSUB 1170:J=J-1
RI 985 ? " ";:V=FIL(S,40):RESTORE 5230:FO
   R N=1 TO V:READ DAT$:NEXT N:? DAT$:J=J
   +1
ZK 990 V=FIL(S,30):RESTORE 5099+V:READ DA
   T$:GOSUB 1160
AU 1000 V=FIL(S,31):RESTORE 5111+V:READ D
   AT$:GOSUB 1160
TN 1010 V=FIL(S,32):GOSUB 1140
UF 1020 V=FIL(S,33):GOSUB 1140
UX 1030 V=FIL(S,34):GOSUB 1140
VP 1040 V=FIL(S,35):GOSUB 1140
UI 1050 V=FIL(S,36):RESTORE 5180:FOR N=1
   TO V:READ DAT$,D,E:NEXT N:GOSUB 1160
VA 1060 V=FIL(S,37):RESTORE 5180:FOR N=1
   TO V:READ DAT$,D,E:NEXT N:GOSUB 1160
YH 1070 V=FIL(S,38):IF V=0 THEN 1090
KX 1080 RESTORE 5150:FOR N=1 TO V:READ DA
   T$:NEXT N:GOSUB 1160
AG 1090 IF FIL(S,12)<>1 OR L=9 OR S+1=VIC
    THEN POP :GOTO 1110
NX 1100 S=S+1:NEXT I
PK 1110 POSITION 3,15:? "press fire when
   study completed"
EK 1120 POKE 77,0:IF STRIG(0)=1 THEN 1120
AK 1130 RETURN
ZK 1140 IF V=0 THEN RETURN
AC 1150 RESTORE 5220:FOR N=1 TO V:READ DA
   T$:NEXT N
ZQ 1160 IF V=0 THEN RETURN
KJ 1170 POSITION I*20,J:? DAT$;:J=J+1:RET
   URN
YB 1200 POSITION 0,21:? "Are you sure you
    want to charge ? (Y/N)":OPEN #1,4,0,"
   K:"
OH 1210 GET #1,C:IF C=78 THEN CLOSE #1:GO
   TO 800
TY 1220 IF C<>89 THEN 1210
EO 1230 CLOSE #1:IF PTS<0 THEN PTS=0
YN 1250 ? CHR$(125):POKE 752,1:? "} T I
   M E   T O   K I L L":R=INT(PTS/20)
SJ 1260 POSITION 14,21:? "RATING % ";R
BR 1270 POSITION 0,4:? "Which suspect are
    you charging ?":? "Select with joysti
   ck,then press fire.":I=1
IF 1280 POSITION 19,7:? I;" ":FOR D=1 TO
   10:NEXT D
QG 1290 I=I+(STICK(0)=14)-(STICK(0)=13):I
   F I=0 THEN I=11
BF 1300 IF I=12 THEN I=1
JU 1310 IF STRIG(0)=1 THEN 1280
AU 1315 SUS=MRD:IF MRD>VIC THEN SUS=MRD-1
CD 1320 IF I=SUS THEN PTS=PTS+200:GOSUB 2
   000:GOTO 1350
IX 1330 ? :? "I'm afraid it was suspect "
   ;SUS:PTS=PTS-900:GOSUB 2010
FX 1350 ? CHR$(125):POKE 752,0:? "How was
    the victim murdered ?"
VJ 1360 C=2:A=2:K=19:L=62
EE 1361 IF METH<4 THEN E=3:G=5
BR 1362 IF METH>3 AND METH<7 THEN E=6:G=8
PG 1363 IF METH>6 AND METH<10 THEN E=9:G=
   11
NS 1364 IF METH>9 AND METH<12 THEN E=12:G
   =13
EN 1366 IF METH>11 AND METH<14 THEN E=14:
   G=15
DF 1368 IF METH>13 THEN E=16:G=19
LY 1370 FOR J=E TO G:RESTORE 5130:POSITIO
   N 0,J:? CHR$(L+J);" ";
TR 1380 IF J<9 THEN ? "BATTERED WITH A ";
   :GOTO 1450
KZ 1390 IF J<14 THEN ? "STABBED WITH A ";
   :GOTO 1450
JY 1400 IF J<16 THEN ? "POISONED BY ";
EF 1410 IF J=16 THEN ? "STRANGLED BY A ";
AW 1420 IF J=17 THEN ? "DROWNED IN THE ";
WZ 1430 IF J=18 THEN ? "TRIPPED BY A ";
OX 1440 IF J=19 THEN ? "BLOWN UP BY ";
JU 1450 FOR D=1 TO J-2:READ DAT$:NEXT D:?
    DAT$:NEXT J:POSITION 14,21:? "RATING
   % ";R
LK 1460 POSITION 0,C-1:? CHR$(29);
RO 1470 FOR D=1 TO 10:NEXT D:IF STICK(0)=
   13 AND C<>K THEN C=C+1:? CHR$(29);
UL 1480 IF STICK(0)=14 AND C<>A THEN C=C-
   1:? CHR$(28);
LT 1490 IF STRIG(0)=1 THEN 1470
DN 1500 LOCATE 0,C,L:L=L-128*SGN(L-127):L
   =L-64:IF L<1 THEN 1460
JC 1510 POKE 752,1:IF L=METH THEN GOSUB 2
   000:GOTO 1550
UJ 1520 RESTORE 5130:FOR J=1 TO METH:READ
    DAT$:NEXT J:POSITION 0,23:? "I'm afra
   id it was the ";DAT$;:GOSUB 2010
BV 1550 ? CHR$(125):POKE 752,0:? "What wa
   s the most probable motive ?"
DI 1560 C=8:A=8:K=12:L=49:FOR J=9 TO 12
WU 1570 POSITION 0,J:? CHR$(L);" ";:L=L+1
OM 1580 IF J=9 THEN ? "There was a fierce
    argument."
RZ 1590 IF J=10 THEN ? "Ill-feeling,grudg
   e or revenge."
YC 1600 IF J=11 THEN ? "Robbery."
OB 1610 IF J=12 THEN ? "Sex-related,such
   as lust or infidelity"
AL 1620 NEXT J:? CHR$(29);:POSITION 14,21
   :? "RATING % ";R
LF 1630 POSITION 0,C-1:? CHR$(29);
RJ 1640 FOR D=1 TO 10:NEXT D:IF STICK(0)=
   13 AND C<>K THEN C=C+1:? CHR$(29);
UG 1650 IF STICK(0)=14 AND C<>A THEN C=C-
   1:? CHR$(28);
KL 1660 IF STRIG(0)=1 THEN 1640
FL 1670 LOCATE 0,C,L:L=L-128*SGN(L-127):L
   =L-48:IF L<1 THEN 1630
MZ 1680 POKE 752,1:IF L=MOT THEN GOSUB 20
   00:GOTO 1700
US 1690 POSITION 0,23:? "I'm afraid it wa
   s motive number ";MOT;:GOSUB 2010
OA 1700 POSITION 0,23:? "Press fire to re
   -examine the files.";
HV 1710 IF STRIG(0)=1 THEN 1710
RD 1720 FOR I=3 TO 11:J=27:IF I=5 OR I=6
   THEN J=31
EU 1730 IF I>6 AND I<11 THEN J=25
CU 1740 FIL(MRD,I+J)=FIL(MRD,I):NEXT I
TV 1750 K=15:GOTO 800
BT 2000 P=R:PTS=PTS+100:GOTO 2020
ET 2010 P=R:PTS=PTS-100:IF PTS<0 THEN PTS
   =0
SX 2020 R=INT(PTS/20):IF R>100 THEN R=100
GQ 2030 FOR J=P TO R:IF P>R THEN FOR J=P
   TO R STEP -1
QL 2040 POSITION 23,21:? J;" ";:SOUND 0,2
   00-J,10,12:SOUND 1,160-J,10,12:FOR D=1
    TO 20:NEXT D:NEXT J
UJ 2050 SOUND 0,0,0,0:SOUND 1,0,0,0
RA 2060 FOR D=1 TO 500:NEXT D:RETURN
OM 3900 FIL(I,39)=INT(RND(0)*12)+1:GOTO 3
   920
LX 3910 FIL(I,39)=INT(RND(0)*12)+13
GS 3920 IF I<2 THEN 3940
ZG 3930 IF FIL(I,12)=2 AND FIL(I,2)<>FIL(
   I-1,2) THEN FIL(I,40)=FIL(I-1,40):RETU
   RN
GF 3940 SUR=INT(RND(0)*20)+1:IF I<2 THEN
   3970
NG 3950 FOR L=1 TO I-1:IF SUR=FIL(L,40) T
   HEN 3940
HI 3960 NEXT L
OV 3970 FIL(I,40)=SUR:RETURN
PD 4000 DIM CS$(32),DAT$(20),FIL(12,40),W
   EP(8),CLU(8),LOC(21,2)
AK 4010 FOR I=1 TO 21:READ D,E:LOC(I,1)=D
   :LOC(I,2)=E:NEXT I
AY 4020 DATA 12,12,20,12,22,16,8,17,1,15,
   37,3,24,3,15,3,7,1,1,1
XW 4030 DATA 1,1,7,1,1,15,23,13,37,10,12,
   12,20,12,14,3,22,3,30,3,30,3
GC 4040 FOR I=1 TO 8:WEP(I)=1:NEXT I:FOR
   I=1 TO 4
DK 4050 J=INT(RND(0)*8)+1:IF I<2 THEN 407
   0
PD 4060 IF WEP(J)=2 THEN 4050
VP 4070 WEP(J)=2:NEXT I
UN 4100 J=0:K=0:FOR I=1 TO 12:J=J+1:FIL(I
   ,1)=J:IF K=1 THEN 4130
UA 4110 IF WEP(J)=1 THEN FIL(I,12)=0:GOTO
    4140
UM 4120 IF WEP(J)=2 AND K=0 THEN K=1:FIL(
   I,12)=1:J=J-1:GOTO 4140
JY 4130 FIL(I,12)=2:K=0
LG 4140 NEXT I:FOR I=1 TO 12
OU 4150 JOB=INT(RND(0)*12)+1:IF I<2 THEN
   4180
NE 4160 FOR L=1 TO I-1:IF JOB=FIL(L,3) TH
   EN 4150
GW 4170 NEXT L
QU 4180 FIL(I,3)=JOB:RESTORE 5100
FB 4190 FOR L=1 TO JOB:READ DAT$,S,W1,W2,
   C1,C2:NEXT L
AE 4200 FIL(I,2)=S:FIL(I,13)=W1:FIL(I,14)
   =W2:FIL(I,17)=C1:FIL(I,18)=C2:GOSUB 38
   90+S*10
MO 4210 HOB=INT(RND(0)*12)+1:FIL(I,4)=HOB
   :RESTORE 5112
XN 4220 FOR L=1 TO HOB:READ DAT$,W1,W2,C1
   ,C2:NEXT L
TE 4230 FIL(I,15)=W1:FIL(I,16)=W2:FIL(I,1
   9)=C1:FIL(I,20)=C2
MW 4240 FOR L=5 TO 6:FIL(I,L)=INT(RND(0)*
   24)+1:NEXT L
KJ 4250 FIL(I,7)=INT(RND(0)*3)+1:FIL(I,21
   )=16:IF FIL(I,2)=2 THEN FIL(I,21)=8
WW 4260 M=4:FOR L=8 TO 10:FIL(I,L)=INT(RN
   D(0)*2)+M
OA 4270 M=M+2:NEXT L
RN 4280 FIL(I,22)=0:IF FIL(I,8)=5 THEN FI
   L(I,22)=18
FA 4290 FIL(I,23)=0:IF FIL(I,9)=7 THEN FI
   L(I,23)=5
LD 4300 FIL(I,24)=0:IF FIL(I,10)=9 THEN F
   IL(I,24)=1
CM 4310 IF FIL(I,3)<>3 THEN 4330
EM 4320 FOR R=13 TO 14:RESTORE 5210:S=INT
   (RND(0)*8)+1:FOR N=1 TO S:READ D:NEXT
   N:FIL(I,R)=D:NEXT R
```

Time to Kill

```
FH 4330 NEXT I
IH 4350 VIC=INT(RND(0)*12)+1
RK 4360 FOR I=3 TO 11:J=27:IF I=5 OR I=6 THEN J=31
FB 4370 IF I>6 AND I<11 THEN J=25
AY 4380 FIL(VIC,I+J)=FIL(VIC,I):NEXT I
WE 4390 IF VIC<2 THEN 4396
BP 4392 IF FIL(VIC-1,1)=FIL(VIC,1) THEN FIL(VIC-1,12)=0:GOTO 4400
HH 4394 IF VIC>11 THEN 4400
AD 4396 IF FIL(VIC+1,1)=FIL(VIC,1) THEN FIL(VIC+1,12)=0
UG 4400 Q=0:FOR SUS=1 TO 12
SD 4410 AP=0:GP=0:RP=0:SP=0:MP=0:IF SUS=VIC THEN 4740
HJ 4420 M=FIL(SUS,2):V=FIL(VIC,2):IF M=V THEN GP=GP+1:SP=SP+1
KH 4430 IF M=1 AND V=2 AND FIL(SUS,1)<>FIL(VIC,1) THEN SP=SP+1
FN 4440 M=FIL(SUS,7):V=FIL(VIC,7):AP=AP+(M=1 OR V=1):GP=GP+(M=2 AND V=3)+(M=1 AND V=3):RP=RP+(M=1)+(M>V)*2+(V=3)
BN 4450 IF FIL(SUS,1)=FIL(VIC,1) THEN AP=AP+1
RS 4460 M=FIL(SUS,8):V=FIL(VIC,8):IF M=4 AND V=4 THEN AP=AP+1
XY 4470 IF M=5 AND V=4 THEN RP=RP+1
UH 4480 IF FIL(SUS,9)=6 AND FIL(VIC,9)=7 THEN GP=GP+1
KR 4490 M=FIL(SUS,10):V=FIL(VIC,10):IF M=8 AND V=9 THEN AP=AP+1:GP=GP+1
RW 4500 IF M=9 AND V=8 THEN AP=AP+1
OF 4510 M=FIL(SUS,4):V=FIL(VIC,4):GP=GP+(V=3 OR V=8 OR V=12)
KA 4520 AP=AP+(M=3 OR V=3)+(M=4 OR V=4)+(M=8 OR V=8)+(M=12 OR V=12)
FM 4530 P=FIL(SUS,5):GOSUB 4600:GOSUB 4640:M=P
MU 4540 P=FIL(SUS,6):GOSUB 4600:GOSUB 4640:M1=P
DT 4550 P=FIL(VIC,5):GOSUB 4600:GOSUB 4620:V=P
LB 4560 P=FIL(VIC,6):GOSUB 4600:GOSUB 4620:V1=P
OO 4570 MP=M+M1+V+V1:GOTO 4700
GR 4600 RESTORE 5180:FOR I=1 TO P:READ DAT$,D,E:NEXT I:RETURN
GU 4620 IF P>4 AND P<10 OR P=11 THEN AP=AP-(D=1):RP=RP-(D=3):SP=SP-(D=4):GP=GP-(E=2)
KE 4640 IF P<5 THEN RP=RP-(D=3):AP=AP-(E=1)
TV 4650 IF P>9 THEN GP=GP+(D=2):RP=RP+(D=3)+(D=1)*2:AP=AP+(E=1)+(E=3)*2:SP=SP+(E=4)+(E=2)*2
BG 4660 RETURN
YL 4700 MP=MP+(M>12 AND V>12 AND M=V)+(M1>12 AND V>12 AND M1=V)+(M>12 AND V1>12 AND M=V1)+(M1>12 AND V1>12 AND M1=V1)
TO 4710 MP=INT(MP/13)+AP+GP+RP+SP:IF FIL(SUS,4)=FIL(VIC,4) THEN MP=MP-2
UK 4720 FIL(SUS,25)=AP:FIL(SUS,26)=GP:FIL(SUS,27)=RP:FIL(SUS,28)=SP:FIL(SUS,29)=MP
WQ 4730 IF MP>Q THEN Q=MP
MR 4740 NEXT SUS
JD 4750 FOR SUS=1 TO 12:IF SUS=VIC THEN 4770
GT 4760 IF FIL(SUS,29)=Q THEN MRD=SUS
NA 4770 NEXT SUS
TR 4800 AP=FIL(MRD,25):GP=FIL(MRD,26):RP=FIL(MRD,27):SP=FIL(MRD,28):I=AP:MOT=1
PO 4810 IF GP>I THEN I=GP:MOT=2
DL 4820 IF RP>I THEN I=RP:MOT=3
PP 4830 IF SP>I THEN MOT=4
DS 4850 IF FIL(MRD,12)=2 THEN ACC=MRD-1
AI 4860 IF FIL(MRD,12)=1 THEN ACC=MRD+1
TB 4870 FOR I=1 TO 4:WEP(I)=FIL(MRD,12+I):NEXT I:METH=WEP(INT(RND(0)*4)+1)
CK 4880 IF FIL(MRD,3)=4 OR FIL(MRD,4)=5 THEN GOSUB 5300:GOTO 4920
JI 4890 IF FIL(MRD,3)=3 THEN METH=INT(RND(0)*17)+1:GOTO 4920
TE 4900 IF FIL(MRD,12)<1 THEN 4920
LY 4910 FOR I=5 TO 8:WEP(I)=FIL(ACC,8+I):NEXT I:METH=WEP(INT(RND(0)*8)+1)
YL 4920 FOR I=1 TO 4
AW 4930 J=INT(RND(0)*8):CLU(I)=FIL(MRD,J+17):IF I<2 THEN 4960
OG 4940 FOR K=1 TO I-1:IF CLU(I)>0 AND CLU(I)=CLU(K) THEN I=I-1
GV 4950 NEXT K
GC 4960 NEXT I
RC 4970 CLU(5)=INT(RND(0)*20)+1
SX 4980 FOR I=1 TO 12:FIL(I,11)=0:NEXT I
ZX 4990 FOR I=1 TO 5
BU 5000 J=INT(RND(0)*12)+1:IF J=VIC OR FIL(J,11)>0 THEN 5000
OZ 5010 IF J=MRD THEN GOSUB 5030:GOTO 5000
HT 5020 FIL(J,11)=CLU(I):NEXT I:GOTO 5050
DZ 5030 L=INT(RND(0)*20)+1:FOR K=17 TO 24:IF FIL(J,K)=L THEN 5030
BN 5040 NEXT K:FIL(J,11)=L:RETURN
HP 5050 BOD=(METH=15)*3+(METH=16)*5+(METH=12)*6+(METH=13)*13:IF METH>11 AND METH<17 AND METH<>14 THEN 5080
JR 5060 IF METH=17 OR RND(0)>0.3 THEN BOD=FIL(VIC,1):IF BOD>2 THEN BOD=BOD+13:GOTO 5080
IK 5070 BOD=INT(RND(0)*13)+3
WS 5080 FOR I=1 TO 12:IF I=VIC THEN 5090
FS 5085 FOR J=30 TO 38:FIL(I,J)=0:NEXT J
MT 5090 NEXT I:GOTO 6000
IK 5100 DATA BRICKLAYER,1,2,5,9,17
OP 5101 DATA BUTCHER,1,7,9,2,15
PN 5102 DATA BUTLER,1,0,0,3,11
KT 5103 DATA CALL-GIRL,2,16,16,10,19
VZ 5104 DATA CARPENTER,1,3,8,15,19
FC 5105 DATA CLEANER,2,4,13,11,13
EM 5106 DATA CROUPIER,2,15,16,7,12
DZ 5107 DATA DRESSMAKER,2,11,16,8,16
OU 5108 DATA FIREMAN,1,6,7,9,14
WN 5109 DATA HAIRDRESSER,2,11,13,2,10
PH 5110 DATA MECHANIC,1,3,10,11,14
FR 5111 DATA QUARRYMAN,1,4,17,9,14
LM 5112 DATA CAMPING,9,14,3,4
BP 5113 DATA DRINKING,1,12,3,6
UX 5114 DATA ENTERTAINING,1,12,3,6
CF 5115 DATA FOOTBALL,6,15,11,20
BK 5116 DATA GAMBLING,15,16,7,12
SP 5117 DATA GARDENING,2,5,9,13
ZS 5118 DATA HOME-COOKING,1,9,3,6
VT 5119 DATA HOME D-I-Y,2,10,15,17
XW 5120 DATA MAGIC ART,12,17,4,12
UH 5121 DATA MODEL-MAKING,9,11,15,19
EG 5122 DATA ROCK CLIMBING,6,14,9,20
MV 5123 DATA SCULPTING,3,8,2,15
GM 5130 DATA BOTTLE,HALF-BRICK,HAMMER,SHOVEL,TROWEL,HEAVY BOOT,MACHETE,CHISEL,KNIFE,SCREWDRIVER
MY 5140 DATA PAIR OF SCISSORS,CYANIDE,BLEACH,NYLON CORD,SWIMMING-POOL,BOOBY-TRAP THREAD,DYNAMITE
FG 5150 DATA ANIMAL HAIRS,BLADE-SHARPENER,BOTTLE-OPENER,BOX OF MATCHES,CIGARETTE-END,COCKTAIL-STICK,DICE
RR 5160 DATA HAIR-GRIP,HEAVY BOOT MARKS,LADIES COMB,LOCKER-KEY,PLAYING-CARD,RUBBER GLOVE,SAFETY-GLASSES
BS 5170 DATA SAWDUST,SHIRT-BUTTON,SPIRIT-LEVEL,TRAIN-TICKET,VARNISH-BRUSH,VITAMIN-PILL BOX
HZ 5180 DATA GENEROUS,3,0,HONEST,3,0,TIMID,3,1,FEEBLE,3,1,LOYAL,4,0,POLITE,1,0,UNSELFISH,1,2,QUIET,1,2,SECRETIVE,3,2
RT 5190 DATA MATERIALISTIC,3,0,STRONG,3,0,BRAVE,3,1,JEALOUS,2,4,NOISY,2,1,SELFISH,2,1,BOSSY,2,1,BOASTFUL,3,4
YH 5200 DATA HOT-TEMPERED,2,3,SLANDEROUS,2,0,PROMISCUOUS,2,2,IMMORAL,2,2,CRUEL,2,3,DISHONEST,1,4,GREEDY,1,4
ZS 5210 DATA 4,5,7,8,10,13,14,17
NW 5220 DATA POOR,AVERAGE WEALTH,WEALTHY,CAR-OWNER,NO CAR,NON-SMOKER,SMOKER,NO PETS,PET-OWNER
RV 5230 DATA ANDERSON,BARNES,CLARKE,DAVIES,EWING,FOSTER,GARNER,HUGHES,JONES,KELLY
WG 5240 DATA LEE,McDONALD,NEWTON,PALMER,RAMSAY,SAVAGE,STEVENS,SULLIVAN,TAYLOR,WILDE
BG 5250 DATA BOB,BRIAN,CHRIS,COLIN,DAVID,JOHN,PETER,PHILIP,STEVE,TERRY,TONY,TREVOR
FJ 5260 DATA CAROL,CATHY,EILEEN,FIONA,JANET,LINDA,LIZ,LOUISE,SUZANNE,TRACY,TRICIA,YVONNE
QY 5300 FOR I=5 TO 8:WEP(I)=FIL(VIC,8+I):NEXT I:METH=WEP(INT(RND(0)*8)+1):RETURN
YM 6000 POKE 106,PEEK(106)-5:GRAPHICS 0:POKE 559,0:POKE 755,0:MTOP=PEEK(106):CS=(MTOP+1)*256:RESTORE 6020
IO 6010 FOR I=1 TO 32:READ D:CS$(I,I)=CHR$(D):NEXT I:A=USR(ADR(CS$),57344,CS)
UX 6020 DATA 104,104,133,204,104,133,203,104,133,206,104,133,205,162,4,160
OW 6030 DATA 0,177,203,145,205,136,208,249,230,204,230,206,202,208,240,96
NG 6040 FOR I=1 TO 18:READ C:FOR J=0 TO 7:READ D:POKE CS+C*8+J,D:NEXT J:NEXT I
DC 6050 DATA 1,255,161,191,165,165,253,133,255,3,255,255,255,255,255,255,255,255
LZ 6060 DATA 4,255,128,128,128,255,128,128,128,5,255,1,1,1,255,1,1,1
CM 6070 DATA 6,112,112,112,0,112,112,112,112,7,112,80,80,80,80,80,80,208
WL 6080 DATA 8,28,28,28,4,28,28,28,28,9,116,20,28,28,28,28,84,4
XW 6090 DATA 10,0,24,24,24,8,28,116,28,11,28,28,28,28,8,8,8,28
ZN 6100 DATA 12,0,0,0,0,24,48,112,254,13,224,224,254,114,18,18,16,24
DF 6110 DATA 14,255,255,24,24,24,24,24,24,15,102,102,102,102,102,102,102,102
VO 6112 DATA 26,32,112,120,112,0,112,112,112,27,248,80,80,80,80,80,80,216
ZL 6114 DATA 28,8,28,124,28,0,28,28,28,29,124,20,20,20,20,20,20,116
TP 6120 POKE 756,CS/256:POKE 106,MTOP
SC 6130 SMEM=MTOP-15:SADD=SMEM*256:FOR I=SADD TO SADD+2304:POKE I,0:NEXT I
FY 6140 FOR I=1536 TO 1540:READ D:POKE I,D:NEXT I
FI 6150 POKE 1541,MTOP-9:FOR I=1542 TO 1564:POKE I,4:NEXT I
GB 6160 POKE 1565,65:POKE 1566,0:POKE 1567,6
YC 6170 DATA 112,112,112,68,0
PT 6180 RESTORE 6170:FOR I=1568 TO 1572:READ D:POKE I,D:NEXT I
MZ 6190 POKE 1573,MTOP-15:FOR I=1574 TO 1596:POKE I,4:NEXT I
ES 6200 POKE 1597,65:POKE 1598,32:POKE 1599,6
PS 6220 POKE 710,10:POKE 711,136:POKE 712,66:POKE 560,0:POKE 561,6:POKE 88,0:POKE 89,MTOP-9:? CHR$(125)
MS 6250 COLOR 47:FOR I=17 TO 19:PLOT 8,I:DRAWTO 21,I:NEXT I
JL 6260 COLOR 163:FOR I=25 TO 38:FOR J=13 TO 18:PLOT I,J:NEXT J:NEXT I
YD 6270 COLOR 33:FOR I=1 TO 10:READ D,E:PLOT D,E:FOR J=1 TO 3:READ D,E:DRAWTO D,E:NEXT J:NEXT I
TU 6280 FOR I=1 TO 9:READ D,E:PLOT D,E:READ D,E:DRAWTO D,E:NEXT I
KU 6290 PLOT 29,5:PLOT 15,9:PLOT 9,6:PLOT 7,9
SV 6300 COLOR 35:PLOT 22,20:DRAWTO 22,16:DRAWTO 7,16:DRAWTO 7,20:DRAWTO 22,20
SY 6310 PLOT 39,19:DRAWTO 39,12:DRAWTO 24,12:DRAWTO 24,19:DRAWTO 39,19
MP 6320 COLOR 36:PLOT 1,7:DRAWTO 1,14:COLOR 37:PLOT 2,7:DRAWTO 2,14:COLOR 46:PLOT 12,3:PLOT 13,3
DL 6330 D=LOC(BOD,1):E=LOC(BOD,2):IF BOD<11 THEN COLOR 44:PLOT D,E:COLOR 45:PLOT D,E+1
VL 6340 G=1
IP 6350 DATA 2,3,0,3,0,20,1,20,0,2,0,0,4,0,4,3,5,0,8,0,8,3,6,3,17,2,17,0,29,0,29,3,30,2,31,2,31,6,23,6
GI 6360 DATA 30,0,39,0,39,9,26,9,4,20,4,17,6,17,6,9,4,18,4,20,6,20,6,18,7,15,14,15,14,9,9,9,15,15,22,15,22,9,17,9
LZ 6370 DATA 23,9,24,9,1,6,3,6,3,6,3,14,3,20,6,20,6,20,6,18,9,0,16,0,8,4,8,6,11,6,21,6,17,4,17,5
XH 6380 DATA 24,13,24,18,23,9,24,9,3,6,3,14,9,0,16,0,8,4,8,6
TV 6390 R=FIL(G,1):S=FIL(G,2):N=FIL(G,12):IF R=3 THEN 6500
OU 6400 IF S=1 THEN K=40:L=41
SY 6410 IF S=2 THEN K=42:L=43
HV 6420 IF G=VIC THEN K=32:L=32
EG 6430 D=LOC(R,1)-2:E=LOC(R,2)-1:IF N=0 OR N=1 THEN COLOR K:PLOT D,E:COLOR L:PLOT D,E+1
AP 6440 IF N=2 THEN COLOR K:PLOT D+1,E:COLOR L:PLOT D+1,E+1
CQ 6450 G=G+1:GOTO 6390
BW 6500 POKE 560,32:POKE 561,6:POKE 88,0:POKE 89,MTOP-15:RESTORE 6540
FH 6510 COLOR 33:FOR I=1 TO 7:READ D,E:PLOT D,E:FOR J=1 TO 5:READ D,E:DRAWTO D,E:NEXT J:NEXT I
LD 6520 FOR I=1 TO 3:READ D,E:PLOT D,E:FOR J=1 TO 4:READ D,E:DRAWTO D,E:NEXT J:NEXT I
YS 6530 PLOT 0,2:DRAWTO 0,0:DRAWTO 3,0:PLOT 0,12:DRAWTO 0,13
ZN 6540 DATA 9,6,8,6,8,0,16,0,16,6,11,6,17,6,16,6,16,0,24,0,24,6,19,6,25,6,24,6,24,0,32,0,32,6,27,6,33,7,32,7,32,0
EQ 6550 DATA 39,0,39,7,35,7,17,9,22,9,22,15,14,15,14,9,15,9,9,9,14,9,14,15,6,15,6,9,7,9,5,14,6,14,6,17,0,17,0,14,3,14
KA 6560 DATA 23,15,24,15,24,12,39,12,39,8,3,6,3,11,0,11,0,3,2,3,4,3,4,0,8,0,8,3,6,3
SN 6570 COLOR 36:PLOT 1,6:DRAWTO 1,10:COLOR 37:PLOT 2,6:DRAWTO 2,10
FO 6580 D=LOC(BOD,1):E=LOC(BOD,2):IF BOD>10 THEN COLOR 44:PLOT D,E:COLOR 45:PLOT D,E+1
VQ 6590 R=FIL(G,1):S=FIL(G,2):N=FIL(G,12):IF R=9 THEN RETURN
OY 6600 IF S=1 THEN K=40:L=41
TC 6610 IF S=2 THEN K=42:L=43
HZ 6620 IF G=VIC THEN K=32:L=32
BX 6630 D=LOC(R+13,1)-2:E=LOC(R+13,2)-1:IF N=0 OR N=1 THEN COLOR K:PLOT D,E:COLOR L:PLOT D,E+1
AT 6640 IF N=2 THEN COLOR K:PLOT D+1,E:COLOR L:PLOT D+1,E+1
LT 6650 G=G+1:IF G=13 THEN RETURN
WV 6660 GOTO 6590
```

8. VERSION TRACKER

Ian Finlayson discovers a way to keep track of all those revisions whenever you write a program - with this routine you should always have the most recent revision to hand

A while ago in the third of this series of articles (Issue 30) I introduced the concept of the forced read mode which is an attribute of the 8 bit Atari computers that allows a program to modify itself. This is a very powerful facility and a particularly useful application has come to my attention which I will describe here. I will not dwell too long on the theory of forced read - if you did not see Issue 30 you can either send for a copy or write to me (enclosing a SAE) for more information.

The short program with this article is, perhaps, not strictly a subroutine. It is a short routine which you can attach to your programs during program development as a tool, and it should be deleted once the program is finished. The tool provides a means of quickly 'stamping' your developing program with a letter which shows what revision it is at, and then saving that version with a unique file name. If you are a tape user the file name is not much use, but you can still save your program and when you load it later you can find out which version it is.

THE LISTING

Ignore line zero at the moment, I will come back to it later.

Line 32010 - The Graphics 0 call clears the screen. The cursor is then positioned a little way down the screen and line 32018 is listed on the screen.

Line 32012 - LOCATE 24,6,TT23 returns the value under the cursor when it is in position 24,6 to variable TT23. Another way of doing this would be by opening an I/O channel to the screen (OPEN #1,12,0, "S:") and then doing a POSITION 24,6 followed by GET#1,TT23.The position of the locate is set so that TT23 will contain the ASCII code for the extension letter of the filename in line 32018. Now we position the cursor on 24,6, increment the variable by 1, and print the next letter in the sequence over the top of the previous one on the screen. If you save a new version of your work very, very regularly it is theoretically possible for the version letter to reach 'Z'. If this happens (and by now you will have filled several disks!) the IF THEN statement at the end of the line will ensure that you go back to A and not on to a square bracket! CHR$(89) is 'Z' and CHR$(65) is 'A'

Line 32014 - Now we print 'CONT' on the screen a couple of lines below the new line 32018, then position the cursor at the top of the screen, POKE 842 with 13 to enable forced read and STOP to start the forced read of the new line into the program.

Line 32016 - After the forced read reaches the CONT statement on the screen control is returned to the program and this line disables the forced read mode, otherwise very peculiar things will happen next time the program comes to a STOP or END.

Line 32018 - This is the line which is altered. To find out which version of your program you are working on at any time just LIST this line to the screen. As the routine is run this line will save the current version to disk under a file name that has the version letter as an extender. You may wonder why I have put an '@' symbol as the extender - this is an illegal file extender and, although it would not cause the program to crash it would normally be ignored by the operating system. However, '@' is the letter before 'A' in the ASCII table so that the first time you run the routine it will automatically save as LISTING.A.

CASSETTE VERSION

The routine can be used by cassette users by changing line 32018 TO READ:

```
32018 CSAVE :REM ---> @
```

The REM statement has deliberately been structured so that the '@' symbol appears on the screen in the same place as in the disk version, so none of the POSITION commands have to be changed.

Although with a tape machine you cannot save files by name, this routine effectively 'stamps' your program with a letter which indicates the revision level. After you CLOAD it you can find out which revision it is by LISTing 32018.

```
GA 0 GOTO 32010
KP 32009 REM **          PAGE 6         **
             ** SUBROUTINE TUTORIAL-8 **
             **    VERSION TRACKER     **
RP 32010 GRAPHICS 0:POSITION 2,5:LIST 320
   18:POSITION 24,6
JV 32012 LOCATE 24,6,TT23:POSITION 24,6:?
    CHR$(TT23+1):IF TT23=90 THEN POSITION
    24,6:? CHR$(65)
XH 32014 POSITION 2,8:? "CONT":POSITION 2
   ,0:POKE 842,13:STOP
DO 32016 POKE 842,12
AZ 32018 SAVE "D:LISTING.@"
```

LINE ZERO

Did you know that you can have a line number zero in your programs? It is not often used, and it is a good idea not to use it in normal programming though it can occasionally prove to be a real asset if you have left insufficient space at the beginning of a program and later find that a line is needed for DIMensioning variables or some other initialisation sequence.

In this instance it is used to point to the subroutine while you are developing your program and, like the subroutine itself it must be deleted when the program is finished. All the time that line zero is in place an instant SAVE of the current state of the program can be made by just typing RUN.

Clearly line zero could also be used to help in debugging a program by using it to jump into different specific parts of the program skipping title pages or other parts which are known to run correctly, and homing in on the problem areas.

FURTHER DEVELOPMENT

This short, effective routine can be run as it stands and will save itself as often as you like, incrementing the version letter each time. If you would like to use a version number instead the modification to the program is quite easy as long as you only go for versions 0 to 9. If you want to go on to 10 and beyond, things are a little more difficult as you will have two digits to change when you update.

I can think of three further subroutines which could be combined with this routine to form a suite of tools. First a routine to delete the routine when it is no longer needed. This would be fairly easy using forced read again. Just print the required line numbers in a column on the screen, invoke forced read, and the lines disappear ... magic!! Secondly, for disk users, how about a routine to call up a directory of all the 'LISTING' files on the disk from basic so you can see at a glance all the revisions you have made. Thirdly a routine to delete all old versions of the program in a block by letter (such as A to J) would help to tidy things up as you go along.

If you implement any of these ideas or other ideas associated with any of the Tutorial Subroutines I would be delighted to hear about it, and could possibly include your ideas in future articles.

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ORB

by B. Wheaton

A machine language BONUS on this issue's disk

Get this issue's disk and you'll get a superb all-action BONUS program with some fine 3-D effects as you attempt to shoot or avoid huge globes coming at you in Battlezone or Encounter fashion.

The action is set on Oregan 3, a prison asteroid deep in the heart of the Nebula 4 galaxy, where the most dangerous criminals of the Universe are banished. Most accept that escape is impossible and that the best way to eke out their days is in peaceful co-existence but, as always, there are those who rebel. A group of such rebels has stolen a number of Crystalic Sphere transporters and are attempting to escape. Although such attempts are in vain the rebels must be quashed for the sake of the majority of the asteroids inhabitants so Jamar VI, overlord of Nebula 4, has sent in the ORB. On each level there are a number of spheres to destroy and every 3 or 4 levels you must land to check out the situation on the ground. It won't be easy but right is on your side!

The game is controlled by a joystick in port 1. START begins the game and the number of spheres to destroy on each level is shown at the bottom of the screen, as is your score and the ORB's shield strength. The ORB may be manoeuvred forwards and back or to left and right to avoid the spheres and the trigger will fire your phasers. On the landing screens, the trigger will activate the boosters and the craft must be landed centrally.

Stand by for action, the fate of an asteroid is in your hands!

ORB is only available on PAGE 6 Issue disk 35 - get your copy now!

WRITE YOUR OWN BOOK

on a 130XE!

One thousand Pounds! That's what it was going to cost to have 100 copies of my 80 page book published. I had just written a biography of one of my more notorious ancestors, Admiral John Benbow, and wanted to give copies to relatives and maybe even sell a few. But one thousand pounds! I had never imagined it would cost so much. This was certainly not in my budget. So I took another look at my Atari 130XE and Panasonic dot-matrix printer and decided this was going to have to be a do it yourself job.

Most of us have a book or two in us. It could be a cook book, a how to book based on our favourite hobby, or maybe even a short story or our first novel. Then again you may just be interested in publishing a newsletter or a small brochure or a report for work. What I discovered is we have the tools now to create and publish a professional looking product, right at our own desks. And it doesn't have to cost an arm and a leg.

CHOOSING THE RIGHT WORDPROCESSOR

To start with, there are numerous word processing programs on the market which are more than adequate to create our masterpieces. I used AtariWriter Plus because as a beginner it had to be simple. The Menu driven program made it easy as child's play. On such a program you can not only write your text but also design your overall work with a Table of Contents, footnotes or endnotes, bibliography and even an index. There are, however, programs coming out to make things even easier, like Print Tool and Desktop. I did my original book just with AtariWriter Plus but since then I've become more sophisticated and graduated to Paperclip, which I used for my second edition.

Paperclip has the advantage of being command driven. You can do more with it. I transferred my files from AtariWriter Plus to Paperclip with a sub program included with Paperclip. I was then able to revise my text and could even add material from other files using Paperclip's double window feature. With this you can load two files at the same time and move material between them. As I had used a separate file for each chapter in my book this enabled me to move text between chapters. I could not have done this with AtariWriter Plus.

Another helpful program in getting organized is Creative Process. Such a program enables you to develop an outline, briefly describe each point or chapter and rearrange these headings until you're happy. Using a standard word processor you can research your work in an organized fashion, keeping separate files on each sub-point until you're ready to put it all together. Again, if you use Paperclip you can combine and mix these files.. Another feature of Paperclip is that it allows you to produce a customized version and save this to each disk you are working on. You can then boot up Paperclip from your working disk and load files from this same disk, saving a lot of disk swapping. A nice safety feature is automatic saving of text which you can set for any number of key strokes.

THE NEXT STEP

Naturally you'll polish your work with a fair bit of rewriting till it's just right. At this point you'll find a spelling checker quite helpful. It will pick up typing errors and blatant spelling mistakes, but don't count on it to catch everything, especially words that sound the same and grammatical errors. Also, its quite wearing on your disk drive, since the dictionary is too large to load into memory. Nothing beats having your spouse go over your creation. My wife is my best critic and supporter.

Once your work is written the main task in desk top publishing is layout and typesetting. For a small book of 80 to 100 pages this can easily cost five hundred pounds if done by a professional and that's just to prepare your work for the printer! The printer will then charge for paper, actual printing, collating, folding, trimming, and binding.

To do it yourself you need to decide first of all on the size of your book. Since we're doing this on a shoe-string budget I recommend sticking with standard size paper. I chose to make my book 7 by 8 1/2 as it allowed the most words per page for the least cost. By printing on both sides of a sheet of 8 1/2 by 14 I got four pages of my text.

This decided, you need to pick a type font, pitch, and mode. My dot-matrix printer is extremely versatile. It can do both normal and italic style letters, for pitch it offers pica (10 characters per inch), elite (12 cpi), semi-compressed (15 cpi) and compressed (17 cpi). Pica looks like a typewriter font and compressed is quite small and hard to read, so I chose Elite for my main text and semi-compressed for quotations. In Near Letter Quality mode it looks great. Maybe a professional typesetter would sneer but you'd need a magnifying glass to tell it wasn't printed with fixed type.

If you have access to a Laser Printer, of course you can produce print that is equal to typesetting. Most Laser Printers are however hooked up to IBM or Apple compatibles but I suppose you could convert to those modes over a modem with a translator. This would entail a fair bit of tidying up incompatible codes for centring, underlining, print fonts, etc. I chose to keep it simple and stick with my Atari. (Most lasers have an Epson emulation and can be used directly with an 8-bit Atari via a standard Centronics interface - Ed.).
You can now get a rough idea of the number of pages you'll need by having your word processor do a word count. Or better still ask it to do a print preview once you've set up the size of type and page margins.

DESIGN CONSIDERATIONS

Of course in designing the look of your page you will want to think about justification. I prefer a straight right edge for a professional look. If you want a more casual work a jagged edge might do the job best. You'll need to decide on paragraph spacing and indentation. Other print styling and formatting options are bold print and elongated print for headings, underlining, centring portions of your text, or blocking some sections to the right for emphasis. If your printer has the capacity you could

Can you really write a book on an 8-bit Atari? William A. Benbow used his 130XE to produce an 80 page book and shows you how you can produce your own book for the minimum of cost

choose double-column printing. You may want headers or footers and these can be added at this stage, including page numbering. Perhaps you will want to repeat the chapter heading on each page for easy reference.

IT'S LOOKING GOOD!

Now your book is really taking shape. You need to give some thought to title page, artwork, graphics or photographs you may want to include. Photos may require some special treatment to be copied sharp and clear. A professional printer can do this 'screening' treatment called PMT for about £5. Of course if you had some of the new graphic oriented programs you could add some graphics directly to your text but not true photographs.
With the Preview option of your Word Processing Program you can view the appearance of your pages. Better still if you have a word processor like Atariwriter Plus or Paperclip you can set the number of columns you wish to work in. This allows you to edit and design in a form that approaches 'What you see is what you get'. Granted you do have to scroll your viewing window over the larger text page but, nevertheless, this is a tremendous improvement over having to print countless rough copies or toggle back and forth between Preview and Edit functions. You can now further design individual pages by leaving spaces for photos or artwork.
You will need to use the Preview option to break your text into pages. This allows you to see if you need to adjust paragraphs so that pages appear more presentable. Perhaps you don't want lists or certain quotes broken so add a line or delete some words until the page breaks are suitable. The block move option of a word processor allows easy cutting, moving and pasting of text.

TIME TO PRINT IT OUT

You really do need to see your words on paper to get a real picture of what your work will look like, so when you have finished polishing your text and page design, print a draft copy. Although you will be printing on standard 8 1/2 by 11 paper, it is quite easy to set margins to suit your chosen page size and trim later.
If you're happy with the general shape and look of your book you can print a Near Letter Quality copy. Use a good ribbon and monitor the printing to ensure that it is uniform in appearance. If your work is quite long you may need to re-ink or replace your ribbon.
Next, cut your pages to size and paste on full sheets of 8 1/2 by 14 or whatever is suitable. I used my draft copy to do a mock up of my book to get pages in order for pasting. Remember you are probably pasting four smaller pages on to one sheet of paper, two on each side. I learned from experience that when you fold several sheets of paper together, the inner sheets fan out more than the outside ones. This means that when you bind these sheets to form your book they will need to be trimmed. This will result in the inner pages having a narrower outer margin unless you compensate for this when pasting them on the sheets for printing or photocopying. This may take a bit of experimenting but the idea is to leave more of an outer margin on pages that will be in the centre of your book.
Photos and artwork can now be glued in place with rubber based paste and your manuscript is 'camera ready'.

PRINTING OR PHOTOCOPYING?

I researched the cost of both printing and photocopying in my area and decided to go with photocopying. The difference in finished product was not that great and the cost for a small printed run was too rich for my blood. Another decision you will need to make at this stage is the weight of paper you wish to use. Many printers suggested something in the range of 100 gsm paper. This is basically so that print does not show through from one side to the other. It is considerably more expensive but does give a more professional look. Standard paper is 80 gsm weight and I have found it quite satisfactory. It is the most commonly stocked paper in the two standard sizes so is available and affordable. I did, however, go to a heavier paper for the cover of my book. Cover stock comes in a great variety of colours and weights, and though you can't tell a book by its cover this is one area I wouldn't skimp on. First impressions are important. I believe it's worth considering printing or photocopying the cover in colour. If this is one colour copying it will not add much to the cost. Full colour copying on the other hand is quite expensive. I found I could not consider it either for the cover or for inside photographs.
Standard photocopying in bulk is not expensive. It was 2 cents a page for the 4000 copies I needed (40 prints x 100). I only used 2000 sheets of paper because I photocopied each side. To this £80 charge £30 was added for separately printing the cover in colour on cover stock paper. In addition I paid £10 for folding, stapling and trimming. Total cost £120. For this I got 100 copies of my book, an average cost per book of £1.20. Not bad, considering it would have cost me nearly £1000 to have it done professionally! I could have had it bound more expensively. You can choose to have your book glued rather than stapled or even use products like Cerlox. This will add at least one dollar to each copy.
I've already sold enough copies to cover my expenses and start setting up for a second edition. My original 30,000 words have expanded to 60,000 and I plan on 160 pages this time. All these changes can be done quite simply on a standard word processing

WRITE YOUR OWN BOOK *continued*

program just as the original was.

FUTURE DEVELOPMENTS

You may want to experiment with the up and coming desktop publishing software such as Newsroom. These programs promise to help in setting up page size, page design, and typeface. With automatically adjusted margins they make it easy to create spaces for photos and artwork. In addition they should expand the choices of type fonts and add design features like borders, larger headings, and graphics.

Such programs are just coming to Atari. They have been around for a while for the big guns like Apple and IBM and systems include laser printers and digitised pictures. Their popularity and marketability is evidenced in their rapid growth throughout the whole field of personal computing. Writing with the use of word processing programs is the most common use for home computers but the field is about to be revolutionised in much the same way that spreadsheet programs transformed accounting. Programmers have a tremendous opportunity to be part of this development by bringing these enhancements to the 8-bit world of Atari. Our main handicap is of course our limited memory. With improved software there may well be an incentive for memory expansion of our hardware.

With existing software we can not only write our reports, newsletters, short stories, and even full length books - we can design and publish them as well. With desktop publishing software we will be in the same league as the big boys. Eighty column enhancements and high resolution monitors will move us closer to the standard of 'What you see is what you get'. Believe me, the market is there.

With our 8-bit Atari and a decent dot-matrix printer you and I can indeed afford to publish what we write.



ONLY FROM SILICA

Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created. Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built in power supplies and built in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 3 retail outlets at Sidcup, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £9 million and in excess of 80 staff, we offer you unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

** BASIC Language Disk * BASIC Manual * ST Owners Manual * TOS/GEM on ROM*

If you buy your ST from Silica Shop, you will also receive:

** NEOchrome Sampler - colour graphics program * 1st Word - Word Processor*

In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of seven full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

1Mb RAM UPGRADE: Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

TV MODULATOR UPGRADE: Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of over £½ million. We import many software titles direct from the USA and you will find that we have new releases in advance of many of our competitors. Unlike dealers who may only stock selected titles, we have the full range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA.**

AFTER SALES SUPPORT - Only From Silica

Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you up to date with new software releases as well as what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

FREE CATALOGUES - Only From Silica

At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 48 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon & return it to us. This information service is available **ONLY FROM SILICA**.

FREE OVERNIGHT DELIVERY - From Silica

Most orders are processed through our computer within 24 hours of receiving them. Most hardware orders are sent by the overnight GROUP 4 courier service FREE OF CHARGE to customers within the UK. This method helps to ensure minimum delay and maximum protection.

PRICE MATCH - Only From Silica

We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No1 Atari Specialist.

SIDCUP (& Mail Order) **01-309 1111**
1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

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LONDON .... **01-629 1234 ext 3914**
Selfridges (1st floor), Oxford Street, London, W1A 1AB

SO MUCH FOR SO LITTLE!

There is nothing that can compare with the incredible value for money offered by Atari's 520ST-FM. For only £260 (+VAT=£299), you can purchase a powerful 512K RAM computer, with a 95 key keyboard (including numeric keypad), MIDI interface, GEM, a palette of 512 colours, mouse controller, and a 512K built-in disk drive. The 520ST-FM has a TV modulator built-in, and comes with a lead to allow you to plug it straight into any domestic colour television set. The mains transformer is also built-in to the keyboard, so there are no messy external boxes. You couldn't wish for a more compact, powerful and stylish unit. Atari ST computers are now firmly established in the UK, there are nearly 500 software titles already available for a wide variety of applications and the list is growing all the time. And that's not all. When you buy your new 520ST-FM (or any Atari ST computer) from Silica Shop, you will get a lot more, including a FREE Silica ST Starter Kit worth over £100. Read the ONLY FROM SILICA section on the left, to see why you should buy your new high power, low price 520ST-FM from Silica Shop, the UK's No1 Atari Specialists. For further details of the range of Atari ST computers and the FREE Silica ST Starter Kit, complete and return the reply coupon below.

ATARI 520ST-FM NOW ONLY £260 (+VAT=£299)

520ST-FM with 512K RAM & mono monitor £399 (inc VAT)
Upgrade from 512K RAM to 1024K RAM £100 (inc VAT)

ATARI 1040ST-F - NEW PRICE

We are pleased to announce a new reduced price point on the 1040ST-F which is now available for only £499 (inc VAT). The 1040 is a powerful computer with 1Mb of RAM and also includes a built-in 1Mb double sided 3½" disk drive. The 1040 has been designed for use on business and professional applications most of which require a high resolution monochrome or colour monitor. It does not therefore have an RF modulator for use with a domestic TV set. Modulators can be fitted for £49 (inc VAT).

1040ST-F Keyboard Without Monitor .... **£499** (inc VAT)
1040ST-F Keyboard + High Res SM125 Mono Monitor .... **£599** (inc VAT)

If you would like further details of the 1040ST-F, return the coupon below.

MEGA ST's NOW IN STOCK

For the user who requires even more RAM than the 520 or 1040 ST's offer, the new MEGA ST computers are now available. There are two MEGA ST's, one with 2Mb of RAM and the other with a massive 4Mb. Both new computers are fully compatible with existing ST's and run currently available ST software. The MEGA ST's are styled as an expandable Central Processing Unit with open architecture and a detachable keyboard. They are supplied with GEM, a free mouse controller and all extras as with the 520 or 1040. Prices are as follows:

MEGA ST 2Mb Keyboard + CPU .... **£899** (inc VAT)
MEGA ST 2Mb Keyboard + CPU + SM125 Mono Monitor .... **£999** (inc VAT)
MEGA ST 4Mb Keyboard + CPU .... **£1199** (inc VAT)
MEGA ST 4Mb Keyboard + CPU + SM125 Mono Monitor .... **£1299** (inc VAT)

If you would like further details of the MEGA ST's, return the coupon below.

ATARI ST

To: Silica Shop Ltd., Dept PSIX 0588, 1-4 The Mews, Hatherly Road, Sidcup, Kent DA14 4DX

PLEASE SEND ME FREE LITERATURE ON THE ATARI ST

Mr/Mrs/Ms: .... Initials: .... Surname: ....

Address: ....

....

....

.... Postcode: ....

Do you already own a computer
If so, which one do you own? ....

Jumble Cell

How can such a simple program drive you insane? John Lawford's brainteaser will do just that!

If you can solve the Rubik Cube in 49 seconds flat then possibly Jumble Cell is not for you so feel free to leave the page and and get back to discovering the Secret of Life, The Universe and Your Way Round Basingstoke. If you are already in Basingstoke then I was, of course, referring to a totally different town of the same name!

For those kind and obviously intelligent readers who are still with us, here is a quick run down of the story so far. Jumble Cell (don't you just hate puns!) is a game that will try your patience and could put the cat in mortal danger. When you do solve it (and you will - eventually) the clock at the bottom of the screen will show you just how quickly time passes when you're being driven insane.

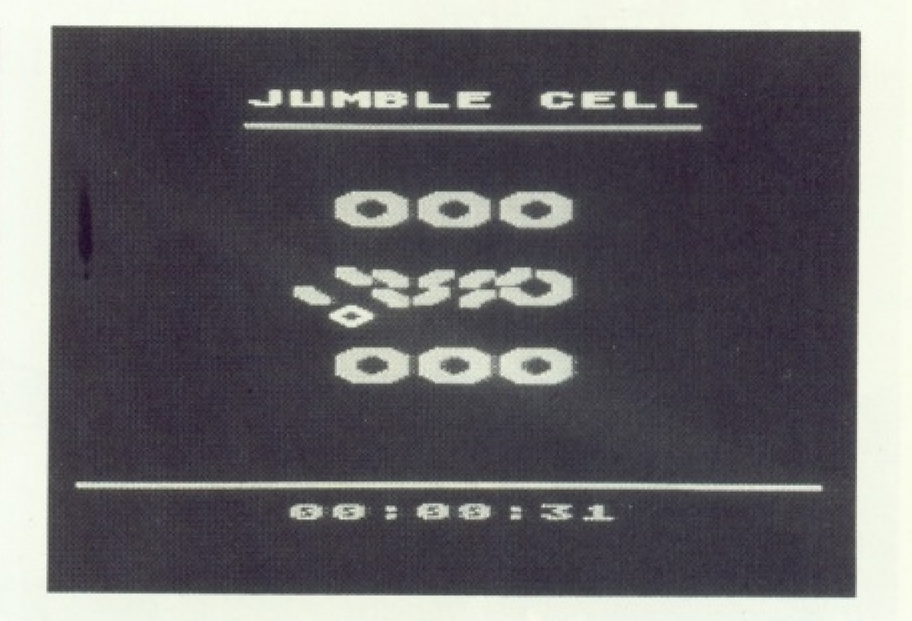
The game opens with three rows of three eight sided cells, then for no apparent reason the computer scrambles the middle line. Oh what a mess! - your task is to re-arrange the jumbled pieces so that you end up with nine perfect cells. A bell will sound and the instruction 'GO' will tell you when it's time to start. Use the joystick to move the white diamond around, as you pass over a piece it will move in the opposite direction to the diamond which will jumble any piece it moves over. All the time the clock is ticking away. Fortunately there is no time limit to the game but your final time will be an incentive to complete the cells more quickly next time.

Just in case you've got the idea that it's impossible to do - remember your ATARI never lies (well not much). Before the 'GO' message appears, the computer will have checked that all the pieces are capable of fitting together - honest!. If things really do get too much you can always press the fire button to reset the clock and give yourself a new set of shapes.

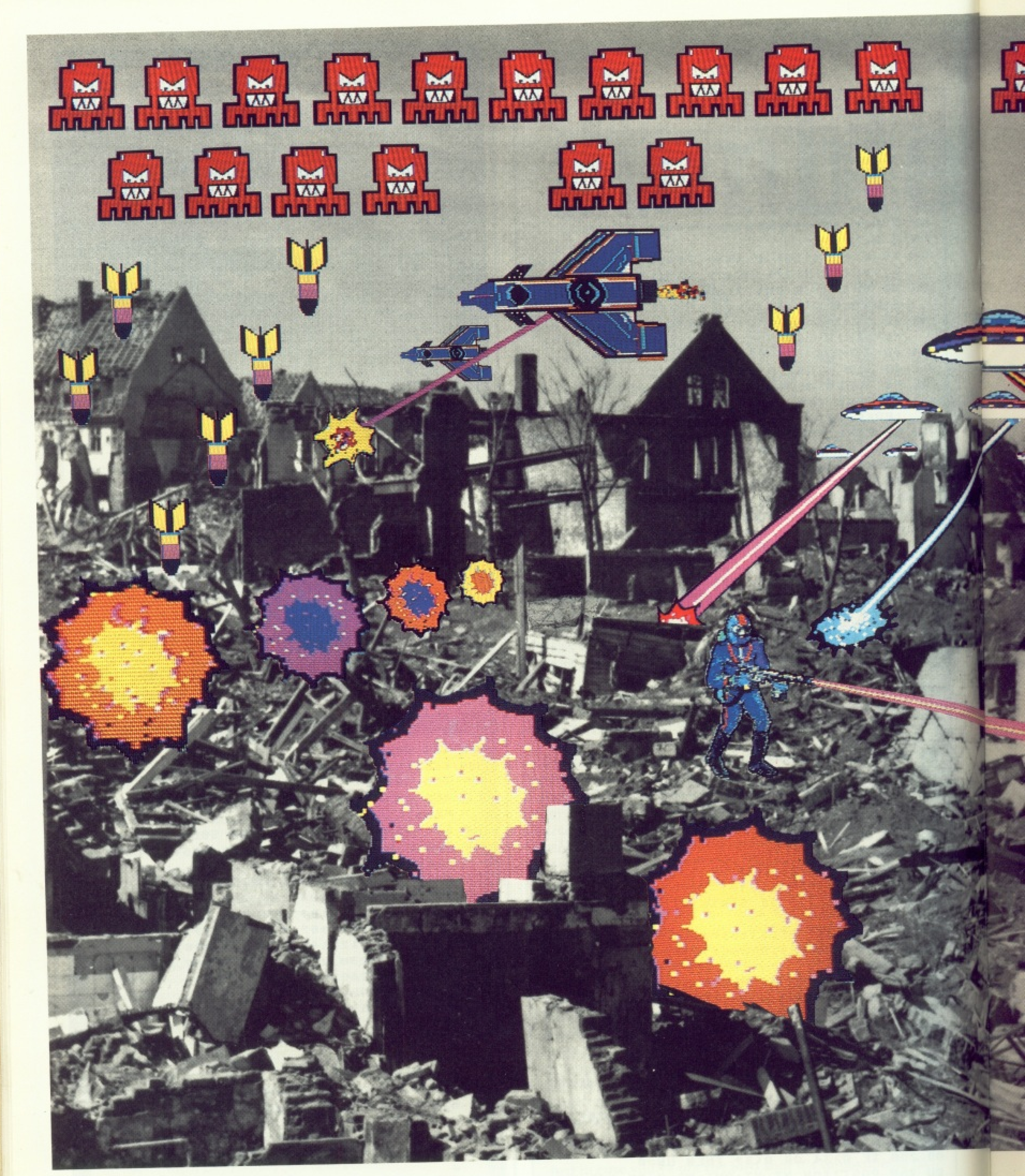
Jumble Cell is not a shoot 'em up arcade game, just a simple bit of harmless fun - just ignore the men in the white coats they're probably only selling ice cream!

Jumble Cell

```
QK 1 REM *****************************
KB 2 REM *       JUMBLE CELL         *
ZB 3 REM *           by              *
YA 4 REM *       John Lawford        *
DZ 5 REM *---------------------------*
HS 6 REM * PAGE 6 Magazine - ENGLAND *
QQ 7 REM *****************************
NN 8 REM
CW 10 DIM DX(15),DY(15),T$(2),B$(2),AR$(1
   ),TT$(8),H$(2),M$(2),S$(2):AR=250
PG 20 DX(14)=0:DX(13)=0:DX(9)=-1:DX(10)=-
   1:DX(11)=-1:DX(5)=1:DX(6)=1:DX(7)=1
MB 30 DY(11)=0:DY(7)=0:DY(6)=-1:DY(10)=-1
   :DY(14)=-1:DY(5)=1:DY(9)=1:DY(13)=1
CM 40 T$="#$":B$="%&":OPEN #1,8,0,"S:"
OI 48 REM REDEFINE CHARACTERS
BE 50 GOSUB 460:POKE 756,CH/256:POKE 708,
   56:POKE 710,72:POKE 709,250:POKE 712,4
   :POKE 711,14:POKE 82,0
AF 60 POKE 752,1:FOR A=7 TO 12 STEP 2:FOR
    B=6 TO 15 STEP 4:POSITION A,B:? #6;T$
   :NEXT B:NEXT A
AR 70 FOR A=7 TO 12 STEP 2:FOR B=7 TO 16
   STEP 4:POSITION A,B:? #6;B$:NEXT B:NEX
   T A:TT$="00:00:00"
BI 80 POSITION 5,1:? #6;"jumble cell":COL
   OR 174:PLOT 5,2:DRAWTO 15,2
UZ 85 COLOR 13:PLOT 1,21:DRAWTO 18,21:POS
   ITION 6,22:? #6;TT$
UQ 90 XT=1:YT=20:COLOR AR:PLOT XT,YT:DX=1
   :DY=1:GOTO 120
WB 100 REM SCRAMBLE THE PIECES
GN 120 FOR I=1 TO 31:RX=INT(5*RND(0)+7):R
   Y=INT(2*RND(0)+10):TRX=RX:TRY=RY:LOCAT
   E TRX,TRY,G
YT 130 IF G>34 OR G<39 THEN COLOR UN2
TE 140 COLOR AR:PLOT RX,RY:COLOR UN2:PLOT
    TRX,TRY:UN2=G:RX=TRX:RY=TRY:NEXT I:GO
   SUB 360
CA 150 IF STRIG(0)=0 THEN ? #6;CHR$(125):
   GOTO 60
MQ 159 H1=0:M1=0:S1=0:POKE 20,0:POKE 19,0
   :POKE 18,0:ST=H1*3600+M1*60+S1
GS 160 POSITION 6,22:? #6;TT$
VE 170 GOSUB 190
OK 180 GOTO 160
EZ 190 S=STICK(0):REM IF S=15 THEN 190
UA 195 TPX=XT+DX(S):TPY=YT+DY(S)
TZ 200 POKE 77,0:IF STRIG(0)=0 THEN POP :
   GOTO 150
WI 202 ET=INT((PEEK(18)*65536+PEEK(19)*25
   6+PEEK(20))/49.85866):CT=ST+ET:H=INT(C
   T/3600)
KI 203 CT=CT-H*3600:M=INT(CT/60)
DO 204 SS=CT-M*60:H=H*(H<24):TT$="00:00:0
   0":H$=STR$(H):M$=STR$(M):S$=STR$(SS)
IX 206 TT$(2+1-LEN(H$),2)=H$:TT$(5+1-LEN(
   M$),5)=M$:TT$(8+1-LEN(S$),8)=S$
SW 210 TPX=XT+DX(S):TPY=YT+DY(S)
RM 220 IF TPX<0 OR TPX>18 THEN TPX=18*(TP
   X>0)+1
GF 230 IF TPY<3 OR TPY>20 THEN TPY=20*(TP
   Y*0)+3
WB 240 LOCATE TPX,TPY,Q
OQ 250 IF Q>34 OR Q<39 THEN UN=0
RU 260 POSITION XT,YT:PUT #6,Q:IF S<>15 T
   HEN GOSUB 320
GV 270 POSITION 6,22:? #6;TT$
VF 280 COLOR AR:PLOT TPX,TPY
OM 290 UN=Q
KP 300 XT=TPX:YT=TPY
ZB 310 RETURN
QZ 320 SOUND 1,25,10,10:FOR W=1 TO 2:NEXT
    W:SOUND 1,0,0,0:RETURN
```




```
QU 330 REM
QW 340 REM
JF 350 REM CHECK THAT PIECES WILL FIT
RK 360 FOR CX=7 TO 12:FOR CY=6 TO 17
KS 370 LOCATE CX,CY,CK
VG 380 TOT=TOT+CK
OU 390 NEXT CY:NEXT CX
RK 400 IF TOT<>2466 THEN CK=0:TOT=0:GOTO
   440
FY 410 CK=0:TOT=0:POSITION 9,4:? #6;"go":
   FOR V=15 TO 0 STEP -0.08:SOUND 1,30,12
   ,V
MK 420 NEXT V:FOR W=1 TO 2:NEXT W:POSITIO
   N 9,4:? #6;"   ":RETURN
QV 430 REM
MO 440 CK=0:TOT=0:POP :GOTO 60
OD 450 END
FC 460 CH=PEEK(106)-8:GRAPHICS 1+16:CH=CH
   *256
XQ 470 DIM MV$(32):RESTORE 500
JV 480 FOR L=1 TO 32:READ B:MV$(L)=CHR$(B
   ):NEXT L
ZZ 490 J=USR(ADR(MV$),CH,57344)
QW 500 DATA 104,104,133,215,104,133
PX 510 DATA 214,104,133,213,104,133
BF 520 DATA 212,162,4,160,0,177
DL 530 DATA 212,145,214,200,208,249
SL 540 DATA 230,213,230,215,202,208
LP 550 DATA 240,96
UM 560 RESTORE 610
MY 570 READ A:IF A=-1 THEN RETURN
PF 580 A=A*8
SY 590 FOR L=0 TO 7:READ B:POKE CH+A+L,B:
   NEXT L
PY 600 GOTO 570
YT 610 DATA 3,0,15,31,63,126,124,120,120
IY 620 DATA 4,0,240,248,252,126,62,30,30
ZT 630 DATA 5,120,120,124,126,63,31,15,0
LC 640 DATA 6,30,30,62,126,252,248,240,0
JA 650 DATA 58,24,60,102,195,195,102,60,2
   4
MY 660 DATA 8,255,255,192,192,192,192,192
   ,192
YQ 670 DATA 9,255,255,3,3,3,3,3,3
KN 680 DATA 13,255,255,0,0,0,0,0,0
ZU 690 DATA 14,0,0,0,0,0,0,255,255
OC 700 DATA 11,192,192,192,192,192,192,25
   5,255
JZ 710 DATA 10,3,3,3,3,3,3,255,255
GG 720 DATA -1
```



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THE MICROLINK CONNECTION

John S Davison looks at a good value modem package that comes with free ST software but can be used just as well with an XL or XE to call Microlink or any Bulletin Board in the world

Interested in going online? If so, you must consider this special communications package from MicroLink, as it has everything the ST user needs to get started, and at a very good price. It contains the MicroLink Multispeed modem, an RS-232 cable, a disk containing Kumas's K-Comm II communications software, and appropriate instruction manuals. Even though the package is aimed at ST users, it's still good value for the 8-bit user, however, you'll need a separate RS-232 interface such as the excellent P:R:Connection (reviewed in Issue 30) and an appropriate interface cable, although you could fit a suitable plug to the cable provided if you're confident wielding a soldering iron. You also need 8-bit communications software, but you'll get this anyway if you buy the P:R:Connection.

As the package is a promotional offer for the MicroLink service you also get free MicroLink registration and its Telex link worth £15, and one month's free connect time on MicroLink and the Telecom Gold service, which could be worth a fortune depending on usage!

THE HARDWARE

The modem is a badge-engineered version of the recently released Pace Linnet 1200, one of the first of the new breed of high specification, low cost modems available in the UK. Its red and black plastic case is small enough to sit neatly under a disk drive. The front fascia carries just six indicator leds - no knobs, switches, or other technofreakery. These indicate power, online, carrier detect, transmit, receive, and auto-answer mode.

The rear panel has sockets for RS-232 cable, phone handset (optional), and low voltage power supply, the PSU for which is incorporated into the three pin mains plug. Connection to the phone system is via a captive lead, the plug of which goes into the normal BT wall socket. There's also a tiny 'panic button' to reset the modem should the need arise.

The modem is intelligent, using commands compatible with the now universally accepted Hayes AT command set. Unusually at this price level it covers V21/V22/V23 standards, allowing full duplex operation at 300, 1200, and 1200/75 (and 75/1200) baud, so meeting the needs of most home users. Speed buffering is provided for computers or interfaces unable to handle split baud rates, such as the 8-bit machines using P:R:Connection or Atari 850 interfaces.

The modem has autodial and autoanswer facilities, autodial working with both pulse and tone dialling, and using phone numbers recalled from its 32 entry battery backed number store, if required.

When dialling you can monitor call progress through the modem's monitor speaker, making it easy to detect any problems with the call, such as no dial tone, number unobtainable, engaged, or the dreaded BT silence. If the engaged tone is detected the modem can automatically redial up to four times - the maximum allowed by BT. Unlike some low cost modems, this one has full BABT approval.

THE SOFTWARE

I reviewed K-COMM II in Issue 29 and found it less than enthralling. The only difference I could see between this packaged version and the original is that the instruction manual supplied here is now physically larger than before and is spiral bound, but otherwise is identical.

For those who didn't see the earlier review I'll briefly describe K-COMM II. It consists of two main parts - K-COMM itself, which is a normal scrolling terminal program used for accessing services such as MicroLink and other scrolling bulletin board systems and K-VIEW, which is a viewdata terminal program allowing you to communicate with PRESTEL and similar systems.

It's quite well endowed with features, including emulation of Teletype, DEC VT52 and VT100, and user defined terminals, support of several different modem types, user defined function keys, XMODEM file transfer, screen logging and snapshotting and auto logon and auto answer facilities.

In the original review of K-COMM II I found problems using several of its features, particularly file handling. This version behaved similarly, so my original comments still stand, however for basic communications access it worked fine - it's good enough to get you started, anyway.

It took only a couple of minutes to get the modem connected to the ST, but ages passed before KCOMM II was installed owing to the incredible number of disk swaps involved. Using two disk drives cuts this dramatically, though. I had no problems communicating with MicroLink, PRESTEL, a private electronic mail service, or a host of bulletin boards.

I also tried the modem out on my 130XE, using the P:R:Connection and the superb 850 Express communications software. It worked flawlessly. In fact, it worked better than my Miracle WS4000, which has one or two compatibility problems with 850 Express. I also tried it with the communications program in Mini

Office II, and once again it worked without fuss, until it died on me with a suspected power supply problem, that is! I assume the problem was peculiar to the review sample and isn't representative of its normal reliability.

CONCLUSIONS

My only grouse is in MicroLink's choice of communications software,as there are better programs available. Even so, this package represents outstanding value for money, particularly for ST users trying communications for the first time. The modem itself is a dream, offering facilities previously only available on modems costing well over twice its asking price. It's so good, in fact, that the package is worth buying just for the modem. Note that the Pace Linnet 1200 on which it's based could cost you over £200 for the modem ALONE!

So, if you've been on the brink of going online, hesitate no more - currently there's no better way to get into the exciting world of telecommunications.

WHAT'S MICROLINK ANYWAY?

As the package is designed to promote MicroLink, it seemed a good idea to try out the service as part of this review. I'm not a MicroLink subscriber, but thanks to our beloved Page 6 Editor who is, I was able to see what it offers.

MicroLink is a closed user group operated by Database Publications (publishers of Atari User and ST User) on Telecom Gold, BT's automated office service. Gold itself provides various electronic office functions, such as text processing, mail, file storage and retrieval, an appointments diary, and links into other services, such as Telex, IDB (a daily computer industry news service), and radio paging. There's a bunch of on-line games too, should you get bored with all this serious stuff.

On its own Gold doesn't have much to offer the home computer user, being aimed more at businesses, however the additional facilities offered by MicroLink make it rather more interesting. But why should you fork out around £40 per year subscription plus connect and usage charges when there are scores of free bulletin board systems (BBS) around?

Firstly, it's available 24 hours every day and has multi-line access, so unlike most free BBS's you don't usually get an engaged signal when dialling in. Secondly, you can stay logged on for as long as you like, whereas most free BBS's set a time limit of 45 minutes or so to prevent individuals hogging them. Thirdly, although it's based in London you can access it via BT's PSS (Packet Switch Stream) service at less cost than long distance phone rates. Finally, it's got facilities not offered by the free BBS's, but not everyone may have a practical use for these.

SOME THINGS ARE FREE ...

After dialling your local PSS access point and getting through the rather unfriendly PSS connection procedure you find yourself in Telecom Gold. At this point you're paying for a local phone call, the PSS link, and MicroLink connect time. A simple command then gives you the MicroLink menu, which may be broadly divided into services available for no additional charge, and those which cost extra.

The 'free' items include things like Bulletin Board, Telesoftware, UK Electronic Mail, MicroLink Newsletter, NewsBytes (computer industry news), and Computer Exhibitions Guide. There are also sections on business, legal, financial, and mortgage matters and WeatherLink, which allows you to download and view satellite weather maps.

... OTHERS YOU PAY FOR

Overseas Electronic Mail, Telex, and gateways into other systems incur extra charges. Some of these are horrendously expensive to use (over 50p per minute!), but are really aimed at business users. Other selections cost extra only if you elect to buy something offered, being a form of electronic shopping. This includes FloraLink, TheatreLink, and Shop Window, which offer flowers delivered via Interflora, theatre ticket booking, and purchase of various computer related items respectively.

OTHER INTERESTS

If you've used a BBS before then you'll feel at home immediately on MicroLink's Bulletin Board. This has many sections, two of which cover Atari ST and 8-bit machines. Others include For Sale, Wanted, Business Adverts, and Computer Jobs, specific areas for other makes of computer and several more unusual areas catering for interests such as Open University and Farming. Some areas didn't seem well supported - in fact, several seemed to contain just rubbish.

Software may be downloaded at no extra charge from the Telesoftware section. When I last checked, it contained 48 programs for the ST and 81 for the 8-bit machines, most being type-in programs from the Atari User and Atari ST User magazines. MicroLink uses 7 data bits instead of the usual 8 for transmission, so binary files have to be encoded for downloading and decoded after you receive them. It also means the XMODEM error detection protocol can't be used, which could cause problems on poor lines. The online help for downloading is rather confusing - nowhere does it explain the need for the decoding program, which has to be downloaded as ASCII BASIC source code first!

WATCH THAT BILL!

You can expect a total MINIMUM cost (using MicroLink and BT off-peak rates,) of around £ 3.00 per hour from the London area to about £5.00 per hour if you live outside the London 01 dialling area. The difference is caused by the need to use long distance phone calls. If you don't use PSS for long distance the cost is even higher. There's the additional £3 plus VAT per month subscription charge too, plus any of the extra charge items should you use them. That monthly bill could get frighteningly large!

Overall, I found using MicroLink an enjoyable experience, but to be realistic I don't think its advantages are worth the cost for the average home computer user. For most people the Bulletin Board and Telesoftware areas are the ones of interest, but these aren't that much better than those on a good free BBS, such as The Ark, or CBABBS.

I use a private worldwide electronic mail network daily, so I don't need convincing of the value of such things for business purposes, but for home use? Not just yet - although the day will surely come!

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MOVE IT WITH CHARACTERS

Animation Techniques using character set redefinition and page flipping

by Robert Gibbons

Animation is a technique used by programmers to add life to their programs and give a sense of realism and movement. Most commercial games have some form of animation which can range from simple character movement to complete moving screens.

As with most aspects of computing there are many ways in which animation can be achieved. One method is to use page flipping which is a process of drawing several separate pictures and flipping between them to give a sense of motion. This can use a lot of memory if you are trying to flip several large screens.

A more effective method of animation is to change the character set being used. A character set is a block of data which the computer uses to assemble characters on screen. There are 256 characters which feature on the screen but only 128 can be changed. This is because the remaining 128 are simply the inverse of the first 128. Each character is made from 8 bytes of information and is constructed on an eight by eight grid. You set the bits for the points on the screen you wish to be on when displayed as in diagram 1. The eight rows (bytes) are used by the computer to display the character and can be found in the DATA statements of listing 1. There are several public domain programs, such as Create-A-Font (disk 20 in the Page 6 library), and several commercially available programs which will help in the design of characters and give the necessary data.

FINDING THE CHARACTERS

Each character has its own internal reference number (see Table 1). The data which we use to make a character must be inserted at the appropriate place in the set to correspond with the character which we wish to change. For example the space character takes up the first eight bytes whereas the letter A begins at byte 264.

```
KK 10 REM ##########################################
XF 12 REM #  ANIMATION DEMO USING TWO #
BV 14 REM #    CHARACTER SETS COPYING  #
MY 16 REM #    EACH CHARACTER TWICE    #
JM 18 REM # -------------------------- #
JT 20 REM # PAGE 6 MAGAZINE - ENGLAND #
KP 22 REM ##########################################
BA 30 REM
FG 40 FOR I=0 TO 1023:J=PEEK(57344+I)
UQ 50 POKE 16384+I,J:NEXT I
FI 60 FOR I=0 TO 1023:J=PEEK(57344+I)
TV 70 POKE 17408+I,J:NEXT I
CY 80 REM Store set 1 character data
HL 90 FOR N=0 TO 7
BH 100 READ A:POKE 16384+N+8,A:NEXT N
MX 110 DATA 24,24,255,24,36,66,129,0
GB 120 REM Store set 2 character data
QH 130 FOR N=0 TO 7
AC 140 READ A:POKE 17408+N+8,A:NEXT N
PT 150 DATA 24,24,60,90,153,24,24,0
VG 160 REM Set up display
RO 170 GRAPHICS 2:POSITION 0,4:? #6;"! !
   ! ! ! ! ! ! ! ! "
KI 180 REM Animate!
ZJ 190 DELAY=100
QA 200 POKE 756,64:FOR I=1 TO DELAY:NEXT
   I
SK 210 POKE 756,68:FOR I=1 TO DELAY:NEXT
   I
LV 220 GOTO 200
```

Listing 1

The set of character data which the computer uses is located at decimal address 57344 (HEX $E000). Because this is in ROM we can't write directly to it so this problem is solved by writing our set elsewhere and then directing the computer to it. By directing the computer to a series of sets, movement can be created. This is a far simpler and quicker way of animating because the computer only requires one address to be altered.

The best way to make a new set is to copy the ATARI's set and modify it to our own needs. This means we don't have to re-create the letters, numbers etc. which might be needed in a program. Copying a set with BASIC can be slow but we'll stay with it for now. Listing 1 is a demonstration of animation which moves arrows across the screen. Type it in and follow the explanation of the program.

The first thing the program does it to copy the character set into a new location at 16384 ($4000 HEX) on lines 40 and 50. Because we're using two character sets the process is repeated but using a different location for the second set, in this case 17408 ($4400 HEX). The next part of the program (lines 90-150) reads the data and stores it in the new locations of our character sets. As mentioned already, the character data is in the form of 8 bytes per character and each character appears in the order shown on Table 1. Our program uses an altered '!' for the animation and therefore the data is stored 8 bytes into the set at 17416. The next routine simply prints a few characters to the screen ready for flipping.

The address used to flip between the character sets is 756 decimal ($2F4 HEX) which is called CHBAS. It is the address which the computer looks at to see where you've put the character set. The default value is 224 but 226 is sometimes used to get the lowercase letters in GRAPHICS 1 or 2. We can store the locations of our new sets here and the computer will automatically display our new sets. The address needs to be in the form of a page number. Each page of memory is 256 bytes long and each character set is 4 pages long. Location 16384 is page 64 (16384/256=64) and location 17408 is therefore page 68.

In our program the page number is stored in location 756, followed by a delay and then the next page number stored. What we see on screen is an instant flip between characters. Lines 190-200 contain a suitable routine to flip the sets. BASIC is slow at copying the character sets but fast enough at changing between sets that we have to put a delay in. Try the program without the delay and see what I mean.

USING EXTRA CHARACTER SETS

The next listing (Listing 2) creates 12 rings on the screen and rotates them using the same technique as shown before. The only significant difference is the number of sets used, in this case four. There are however six positions that the rings take but because they are symmetrical we need only four different sets. If we had used irregular shapes and tried to do the same sort of thing, then we would have needed six sets. Speed is also a

continued overleaf

MOVE IT WITH CHARACTERS continued

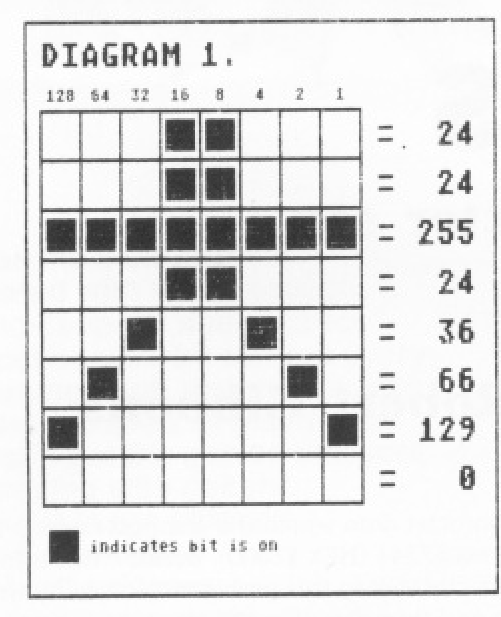


Diagram 1
Characters used in first demonstration

problem. If you are using something which changes slowly then you need more 'in-between' frames. For example, alter the speed of the spinning rings by changing the variable DELAY to 100. Notice how the circles jump between each other and the illusion of movement is lost. When creating your own moving scenes you'll probably need to experiment to find a suitable number of frames and the best speed depending upon the memory you have left. Also notice the new machine code routine to copy character sets on lines 40-80. The routine is called by a statement like line 100. If you use the routine in your own programs, simply replace the number 16384 by the address of the location you wish your new set to be located at.

USING MACHINE CODE

As mentioned before, BASIC is slow at doing the copying but fast enough to flip sets. If you were using these techniques in another situation where you needed the computer to do other tasks at the same time then the timing of the flipping would be affected. The only way to get around this is to use machine code. Don't worry if you haven't any knowledge of machine code as the routine presented here can be used in your own programs if you wish to do so. The routine works by changing the character sets during a space of time called the vertical blank interrupt (VBI). This is the time in which it takes the electron beam in your television to move from the bottom right of the screen up to the top left to start the picture again. The VBI occurs every 1/50th of a second and the computer is able to leave whatever it was doing, execute the routine during the VBI, and come back to what is was doing before. Our routine reads the order of character sets and stores it in CHBAS. When it reaches the last number it goes back to the beginning just like the previous two BASIC programs have done. Listing 3 uses the VBI routine to make the old Page 6 logo move using five different sets in eight positions. Notice how you can still type and program while the logo is spinning. The VBI routine is on lines 520 to 630 and to use it in other programs simply put the speed on line 590 and the order of sets on line 610. Line 630 is needed to mark the end of the sets.

Hopefully you now have some insight into animation and how to implement it into your own programs. You should now be able to make your own animated sequences and use all 128 characters if you wish to create a masterpiece to rival even Walt Disney! There still remains much room for experimenting and if you want further reading then I suggest the Computer Animation Primer by David Fox and Mitchell Waite from Byte Books which covers other aspects of animation and some of those described here.

```
KK 10 REM #############################
EJ 12 REM #      ANIMATION DEMO TWO    #
NG 14 REM # USING FOUR CHARACTER SETS #
JA 16 REM #    AND M/C TO MOVE SETS    #
JM 18 REM # ------------------------- #
JT 20 REM # PAGE 6 MAGAZINE - ENGLAND #
KP 22 REM #############################
BH 24 REM
QS 30 REM M/C routine to move char. sets
KB 40 DIM ROUT$(34):FOR I=1 TO 34:READ A:
   ROUT$(I,I)=CHR$(A):NEXT I
MB 50 DATA 104,104,133,207,104,133,206,16
   9,0,133
HH 60 DATA 204,169,224,133,205,162,4,160,
   0,177
PL 70 DATA 204,145,206,136,208,249,230,20
   5,230,207
DN 80 DATA 202,208,242,96
EJ 90 REM Call M/C routine to move sets
QL 100 X=USR(ADR(ROUT$),16384)
OQ 110 X=USR(ADR(ROUT$),17408)
MM 120 X=USR(ADR(ROUT$),18432)
TJ 130 X=USR(ADR(ROUT$),19456)
YX 140 REM Store set 1 data
LW 150 FOR I=0 TO 31:READ A:POKE 16384+8+
   I,A:NEXT I
JE 160 DATA 7,24,32,64,64,128,128,128
EN 170 DATA 128,128,128,64,64,32,24,7
FG 180 DATA 224,24,4,2,2,1,1,1
NF 190 DATA 1,1,1,2,2,4,24,224
ZJ 200 REM Store set 2 data
JA 210 FOR I=0 TO 31:READ A:POKE 17408+8+
   I,A:NEXT I
BR 220 DATA 1,2,4,8,8,8,16,16
WF 230 DATA 16,16,8,8,8,4,2,1
WU 240 DATA 128,64,32,16,16,16,8,8
XB 250 DATA 8,8,16,16,16,32,64,128
AO 260 REM Store set 3 data
GO 270 FOR I=0 TO 31:READ A:POKE 18432+8+
   I,A:NEXT I
OA 280 DATA 1,1,1,2,2,2,2,2
MY 290 DATA 2,2,2,2,2,1,1,1
EZ 300 DATA 128,128,128,64,64,64,64,64
DI 310 DATA 64,64,64,64,64,128,128,128
BA 320 REM Store set 4 data
PN 330 FOR I=0 TO 31:READ A:POKE 19456+8+
   I,A:NEXT I
JX 340 DATA 1,1,1,1,1,1,1,1
JZ 350 DATA 1,1,1,1,1,1,1,1
CZ 360 DATA 128,128,128,128,128,128,128,1
   28
DB 370 DATA 128,128,128,128,128,128,128,1
   28
VM 380 REM Set up display
TA 390 GRAPHICS 0
KI 400 POSITION 14,7:? "!# !# !# !#"
XJ 410 POSITION 14,8:? CHR$(34);"$ ";CHR$
   (34);"$ ";CHR$(34);"$ ";CHR$(34);"$ "
KL 420 POSITION 14,10:? "!# !# !# !#"
HK 430 POSITION 14,11:? CHR$(34);"$ ";CHR
   $(34);"$ ";CHR$(34);"$ ";CHR$(34);"$ "
MR 440 POSITION 14,13:? "!# !# !# !#"
JQ 450 POSITION 14,14:? CHR$(34);"$ ";CHR
   $(34);"$ ";CHR$(34);"$ ";CHR$(34);"$ "
KH 460 REM Animate!
GB 470 DELAY=15:FOR W=1 TO 6
TU 480 READ Q:POKE 756,Q:REM read order o
   f sets and store in 756
EY 490 FOR I=1 TO DELAY:NEXT I
BP 500 NEXT W:RESTORE 510:GOTO 470
VG 510 DATA 64,68,72,76,72,68
```

Listing 2

```
KK 10 REM ##################################
MA 12 REM #   ANIMATION DEMO USING 3  #
RH 14 REM # 5 CHARACTER SETS WITH VBI #
US 16 REM # M/C ROUTINE TO MOVE SETS  #
JM 18 REM # ------------------------- #
JT 20 REM # PAGE 6 MAGAZINE - ENGLAND #
KP 22 REM ##################################
BH 24 REM
QS 30 REM M/C routine to move char. sets
KB 40 DIM ROUT$(34):FOR I=1 TO 34:READ A:
   ROUT$(I,I)=CHR$(A):NEXT I
MB 50 DATA 104,104,133,207,104,133,206,16
   9,0,133
HH 60 DATA 204,169,224,133,205,162,4,160,
   0,177
PL 70 DATA 204,145,206,136,208,249,230,20
   5,230,207
DN 80 DATA 202,208,242,96
EJ 90 REM Call M/C routine to move sets
QL 100 X=USR(ADR(ROUT$),16384)
OQ 110 X=USR(ADR(ROUT$),17408)
MM 120 X=USR(ADR(ROUT$),18432)
TJ 130 X=USR(ADR(ROUT$),19456)
JF 140 X=USR(ADR(ROUT$),20480)
BD 150 REM Read tha data for the four
JX 160 REM Characters which don't change
GG 170 FOR I=1 TO 5:LOC=15360+(I*1024)
OS 180 FOR D=0 TO 31:READ A:POKE LOC+24+D
   ,A:NEXT D:RESTORE 190:NEXT I
RM 190 DATA 0,3,119,54,28,28,13,15
NW 200 DATA 0,128,128,128,134,180,229,87
DI 210 DATA 14,12,12,12,8,0,0,0
AP 220 DATA 89,113,1,1,0,0,0,0
CA 230 REM Read data for other characters
NU 240 REM Store set 1
SE 250 LOC=15360:RESTORE 270
PQ 260 FOR I=1 TO 5:LOC=LOC+1024:FOR D=0
   TO 31:READ A:POKE LOC+56+D,A:NEXT D:NE
   XT I
KZ 270 DATA 1,1,99,163,163,215,103,7
HV 280 DATA 128,128,128,0,0,240,252,28
RT 290 DATA 14,12,12,12,14,7,7,1
OY 300 DATA 14,6,6,6,14,28,252,240
OI 310 REM Store set 2
DJ 320 DATA 0,0,96,160,160,209,97,1
DX 330 DATA 128,128,128,128,128,192,224,1
   76
ID 340 DATA 1,1,1,1,1,1,0,0
FQ 350 DATA 16,16,16,16,16,176,224,64
PL 360 REM Store set 3
AI 370 DATA 0,0,96,160,160,208,96,0
RX 380 DATA 64,64,64,64,64,64,64,64
FB 390 DATA 0,0,0,0,0,0,0,0
RI 400 DATA 64,64,64,64,64,64,64,64
PV 410 REM Store set 4
BF 420 DATA 0,0,96,160,160,208,96,1
EG 430 DATA 32,32,32,32,32,112,240,176
IE 440 DATA 1,1,1,1,1,1,0,0
FR 450 DATA 16,16,16,16,16,176,224,64
QY 460 REM Store set 5
GU 470 DATA 0,0,96,160,160,209,103,7
HG 480 DATA 48,48,56,24,24,252,252,28
RV 490 DATA 14,12,12,12,14,7,7,1
PA 500 DATA 14,6,6,6,14,28,252,240
SY 510 REM VBI routine data
ZZ 520 FOR I=1536 TO 1608:READ A:POKE I,A
   :NEXT I
LA 530 DATA 104,169,6,160,11,162,6,76,92,
   228,96,173
OF 540 DATA 62,6,201,0,240,6,206,62,6,76,
   58,6
KW 550 DATA 173,63,6,141,62,6,174,61,6,18
   8,64,6
NV 560 DATA 192,255,240,10,140,244,2,232,
   142,61,6,76
KJ 570 DATA 58,6,162,0,142,61,6,76,30,6,7
   6,95,228,1,0
MQ 580 REM Speed=4
OR 590 DATA 4
OD 600 REM Order of sets
AC 610 DATA 64,68,72,76,80,76,72,68
OH 620 REM Mark end of order with 255
IJ 630 DATA 255
FG 640 GRAPHICS 2:POSITION 0,3:? #6;"  #$
   '(  #$'(  #$'("
NP 650 ? #6;"  %&)*  %&)*  %&)*"
KJ 660 REM Animate!
ZT 670 REM Routine requires 1 instruction
DM 680 X=USR(1536)
NX 690 REM Program finished but logo will
    continue until SYSTEM RESET pressed.
NW 700 END
```

Listing 3

Column 1				Column 2				Column 3				Column 4			
#	CHR	#	CHR	#	CHR	#	CHR	#	CHR	#	CHR	#	CHR	#	CHR
0	Space	16	0	32	@	48	P	64		80		96		112	p
1	!	17	1	33	A	49	Q	65		81		97	a	113	q
2	"	18	2	34	B	50	R	66		82		98	b	114	r
3	#	19	3	35	C	51	S	67		83		99	c	115	s
4	$	20	4	36	D	52	T	68		84		100	d	116	t
5	%	21	5	37	E	53	U	69		85		101	e	117	u
6	&	22	6	38	F	54	V	70		86		102	f	118	v
7	'	23	7	39	G	55	W	71		87		103	g	119	w
8	(	24	8	40	H	56	X	72		88		104	h	120	x
9	)	25	9	41	I	57	Y	73		89		105	i	121	y
10	*	26	:	42	J	58	Z	74		90		106	j	122	z
11	+	27	;	43	K	59	[	75		91	①	107	k	123	
12	,	28	<	44	L	60	\	76		92		108	l	124	|
13	—	29	=	45	M	61	]	77		93		109	m	125	①
14	—	30	>	46	N	62	Λ	78		94		110	n	126	①
15	/	31	?	47	O	63	—	79		95		111	o	127	①

Table 1 - Position of characters in character set



TOMAHAWK

You can't keep a good man down! John Davison is up in the air again!

In the hundreds of hours I've spent using many different flight simulation programs I've never flown a helicopter simulator, so I was very pleased to receive Tomahawk for review. It's another of those combat simulator/game hybrids in which you fight an enemy to gain points as well as flying and navigating your aircraft - in this case a Hughes AH-64A Apache advanced attack helicopter.

The disk version reviewed here is supplied in a slim plastic bookform package containing a disk, an excellent instruction leaflet, and a large colourful poster. This shows pictures and full details of the Apache, including notes on helicopter aerodynamics and air-to-air combat techniques. The program's designed for XL/XE machines only, as it needs 64K to run.

After boot-up you can set various simulation parameters. These include mission type (training mode or three different combat scenarios), day or night operation, clear or cloudy conditions (with selectable cloudbase from 50 to 5000 feet), calm or crosswind/turbulence conditions, sound on/off, and finally pilot rating. This last item affects the accuracy of enemy fire in the combat scenarios, and therefore acts as a 'difficulty level' control.

INSTRUMENTATION

The main screen looks familiar, being similar in style to Fighter Pilot, an earlier release from Digital Integration. The top two-thirds of the screen shows a 'through the canopy' 3D view and the remaining part represents the instrument panel.

As befits a good flight simulator there's a lot of instrumentation, but I suspect that it is functionally game oriented rather than realistic. On the left are engine and rotor related instruments, implemented here as 'thermometer style' displays. These cover collective pitch setting, engine torque, engine and rotor blade RPM, fuel level, and throttle setting.

Next to this is TADS (Target Acquisition and Designation System), used to range and identify potential targets as tanks, field guns, or helicopters. To the right of TADS is the pilot's Visual Display Unit showing digital readout of airspeed (forwards or backwards!), altitude, vertical speed, and distance/time to objective. To the right again is a group of instruments showing roll, pitch and sideslip information.

On the far right is the Navigation Display showing current heading, current track (as helicopters can fly sideways!), and bearing of your selected objective. The objective can be any one of eight navigation beacons scattered around the simulation's map area, any of four landing pads in the current sector, any of eight ground targets in the current sector, or air threats, i.e. enemy helicopters. After selecting ground or air target you can choose to use 30mm chain-gun, unguided rockets, or laser guided Hellfire missiles against it. A different shaped gunsight is superimposed on the windscreen to remind you of your choice. Points are scored by destroying enemy tanks, field guns and helicopters, with different values awarded depending on target type and weapon used.

The bottom of the panel graphically displays weapons status, i.e. number of rounds remaining for each weapon. Next to this is your current score, and finally a systems status panel showing when weapons, navigation, TADS or engine systems are damaged by enemy fire. Phew - and I thought flying a helicopter would be easier than an F15!

A map screen shows the layout of your extensive operational area. It's divided into 128 rectangular sectors and shows the position of the eight navigation beacons, mountains, and your current position. Also shown is the enemy helicopter which is always out looking for you. None of the ground targets appear - you have to locate these yourself using your instruments.

In training mode all sectors are friendly, but contain enemy tanks and guns for target practice - they don't shoot back! In combat mode sectors are colour coded to show which are enemy held or under enemy attack. You have to destroy all enemy tanks and guns in those sectors before he destroys yours (or you!).

CONTROLS

Helicopter controls are rather different from their fixed wing counterparts, but have similar effects. The two most important ones control cyclic pitch and collective pitch of the rotor. Cyclic pitch is joystick controlled and is used to tilt the helicopter into a nose-up or nose-down attitude or to roll it from side to side. This also accelerates the aircraft in the direction of tilt, so causing it to fly forwards, backwards, or sideways. Collective pitch is keyboard controlled and causes the helicopter to rise, hover, or descend vertically. Other keyboard controls operate the tail rotor pitch for directional control, and throttle setting.

To fly a helicopter accurately and successfully requires the pilot to constantly adjust all these controls to balance out the forces acting on the aircraft. Fortunately, the Apache has a computerised control system, which does much of the control juggling for you. Even so, it's still a !*?$*! to fly!

It's wise to start in training mode, first learning the use of collective pitch. This enables you to vertically ascend, descend, and hover without overtaxing the engines and causing them to fail. You can then add tail rotor control before going on to tackle the challenge of cyclic pitch.

Then it's a case of learning to co-ordinate the controls, and to counteract the side effects of one by use of another. It's fiendishly difficult at first, but the instructions help, telling you how to handle all of the normal helicopter manoeuvres, including the spectacular 'torque turn'. Safe limits for aerobatics are also given - exceed them and you'll be treated to the program's spectacular crash effects involving much screen flashing, explosions, and windscreen cracking!

7000 GROUND FEATURES!

Missions start on a helipad, and your view beyond it shows equal amounts of green terra-firma and blue sky, with the horizon running across the middle. Scattered around in the distance you can see black dots and a few odd shapes. These are ground features, of which there are over 7,000 in this simulation. Many of them never actual-lyresolve into anything more than a black dot, but they do give the impression of movement as you fly over them. Others turn into recognisable features as you approach - 3D wireframe buildings, pylons, trees, mountains, helipads, and enemy (and friendly) tanks and field guns.

Screen update is 2-3 times a second. Ideally it should be faster, but it's no worse than other good 8-bit simulators. The horizon rises, falls, and tilts realistically and fairly smoothly as you stagger around the sky, and the 3D ground features look reasonable from all angles even though they're only wireframe graphics. Disappointingly, helicopter sounds are restricted to the distinctive thwakka-thwakka noise of the rotor blades - there's no whine or roar from the twin engines.

Once competent you can go into combat. The three scenarios progress in difficulty from clearing four sectors to liberating the whole map. On approaching the enemy, flak starts bursting around you, and unless you continually swerve to confuse enemy gunners it will eventually damage vital helicopter systems, or cause structural damage. Three structural hits cause you to crash. You have three helicopters at your disposal, so you can survive three crashes before having to start a new mission.

FIRST RATE

I've thoroughly enjoyed using Tomahawk. It's a first rate, quality program offering real challenge as a flight simulator and lots of excitement in the tradition of the best combat simulators. It's also very addictive once you can handle those controls. But don't take my word for it - get yourself and your wallet down to your local software store and find out for yourself.

TOMAHAWK
Digital Integration
Cassette £9.95
Disk £14.95

Warriors of Ras

Screenplay/All American Adventures/US Gold
8 bits and a Disk Drive
Price - variable

John Sweeney adventures into the past to find some less well known programs that will still entertain - if you can find them!

The Warriors of Ras is a series of four graphics role-playing games - Dunzhin, Kaiv, Wylde and Ziggurat. They were first released way back between 1981 and 1983 but the first two were re-released in 1986 by All American Adventures/US Gold on a single disk. My local shop was selling the two of them for only #3.99. I also picked up an old copy of the Wylde for a fiver from another shop. Their graphics may look a bit primitive compared to Gauntlet and the scope of the game rather limited compared to Ultima IV, but if you can get them for that sort of price I think you will find them quite good value for money.

Dungeons and Dragons players will immediately recognise most of the the jargon about experience points and levels, but it will not all be familiar as it is based on an alternative set of role-playing rules called THE GAME, FANTASY EDITION (1978). The main differences are in the combat and the movement rules.

Once you have bought weapons, armour and all the other items found useful in dungeons you set off into the game - a bird's eye view of your character exploring the 'dungeon'. Passing through any area causes it to be mapped on the screen for you, so you need to do very little mapping in most of the games.

Most of the denizens of the dungeons will attack you immediately. If you are hit then your armour will usually protect you from the first few points of any damage (until it has deteriorated completely), any other damage removes hit points from the part of your body which the blow struck. When you strike back you must be carrying a suitable weapon and you must specify exactly which bit of the enemy you are aiming for - head, chest, right leg, etc. You may specify that you wish to strike with FORCE, which may inhibit your aim, or you may AIM to give a greater chance of success. Aiming however takes time and the enemy may get in an extra blow. Losing all the hit points for any part of the body brings instant death. This does mean that a lucky blow to a weak area such as the neck can destroy even the strongest of characters and you should save frequently. Fortunately the save facilites are quick and easy to use.

Apart from the monsters there are of course treasures, including one special one in the farthest area of the game which is your objective. The games also include various specials such as weapon repair rooms, or caches of food and weapons.

The input to the game is via single letter commands on the keyboard to aim, bribe, hit, eat, move, etc. Most of the commands need extra information and you can give commands such as DRINK POTION OF STRENGTH. The four games get progressivley more sophisticated: Kaiv introduces potions, rings and wands; Wylde introduces more sophisticated combat involving a close up screen of the fight so that you can manoeuver around the terrain and use more sophisticted weapons such as wands. Ziggurat uses all the facilites of the previous three to reach a set of 26 commands.

Warriors of Ras may initially seem a bit slow, but once you have mastered the controls you should type in the command SPEED which cuts the responses from three seconds to less than one second. My copy of Wylde wouldn't do this, and since the fights may involve half a dozen messages I was often faced with 10 to 15 second responses - a trifle boring! Since there seems to be some variation in this it is probably worth checking before buying. If it hasn't got the SPEED option it is significantly less worth while.

One nice feature of these games is the facility provided for moving a character around between them. Once you have built up a 10th level warrior with 10,000 gold pieces you can save the character rather than the game and then restore him to a different game. Again, my Wylde was slightly flawed in that it didn't prompt for the necessary disk changes. You can overcome this by the following steps: switch to the save disk before entering Y (for Yes, you want to restore a saved character); enter the 'dungeon' (which will appear on the screen as garbage since it omitted to ask you to switch disks back); switch back to the Wylde disk; save the character onto it. Now you can reboot the Wylde disk and load the character from that disk.

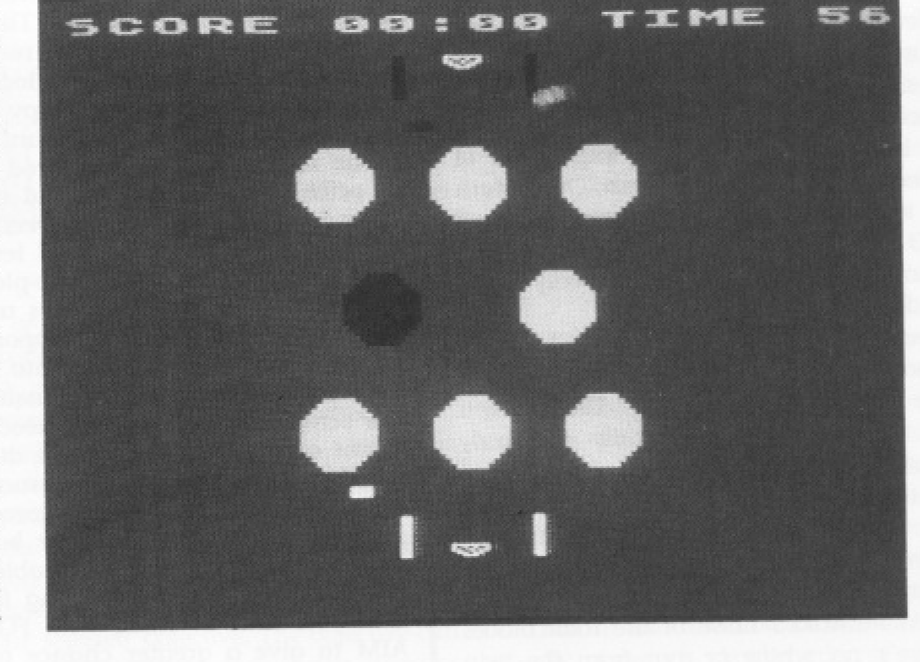
All in all they are quite reasonable little games to while away an hour or two.

REFLEX

by Bill Halsall

Reflex is a machine code game for 1 or 2 players requiring a joystick for each player. The object of the game is to score the most goals in the given time. The field is reminiscent of a netball court with 8 coloured disks corresponding to the 8 directions in which a joystick can be pointed. To take control of a disk point your joystick in that direction and the colour will change to yours. If the ball hits the disk while it is your colour it will be deflected towards your opponents goal.

To move your goalkeeper from one side to the other press the joystick button. You can keep the button pressed permanently to shuttle the goalkeeper back and forth. The goalposts act like disks so it is possible to score straight through them. Player 1 scores goals at the top of the screen and Player 2 scores at the bottom. The game score is displayed at the top of the screen. To play a 1 player game press joystick button 1. For a 2 player game press joystick button 2. In a 1 player game the computer acts as Player 2.



SEVEN LEVELS

There are seven levels of play which can be selected by continually pressing the OPTION key until the desired level is reached. Options available are:

Title	Ball Speed	Computer Reaction Time in 1/50 secs
Reflex	slow	127
Reflex 1	slow	63
Reflex 2	slow	31
Reflex 3	fast	127
Reflex 4	fast	63
Reflex 5	fast	31
Reflex 6	fast	15

Obviously, in 2 player games the computer reaction times don't apply so the choice is effectively between slow and fast ball speed.

The game is different to most and joystick control takes a little getting used to so it is recommended that you play the standard game to begin with. It is fun to lose 21-0 in Reflex 6 the first time you play but quite demoralising! The title of the game comes from the fun I had trying to beat the computer the first time I programmed the game. This version had a computer reaction time of 1 50th second! I didn't win!

FAST AND FURIOUS

1 OR 2 PLAYER ACTION

TYPING IT IN

Cassette and disk users should type in Listing 1, SAVE or CSAVE a copy, then RUN the program. The program will check each line of data and inform you of any errors. Correct any errors and RUN the program again until all errors are eliminated. When this is done answer the cassette/disk questions accordingly to create a boot tape or binary disk file.

To load the boot tape remove all cartridges then turn on the computer while holding down the START key (XL owners should hold down OPTION as well). Press RETURN and the tape will load and run automatically.

Disk users should type in Listing 2 and save it on the same disk as the binary file created by Listing 1. RUN the Listing 2 program with the disk in the drive and the game will load and run automatically.

Note for disk users: If any other programs have been used prior to Listing 2 being loaded it is recommended that the computer be turned off and on again before Listing 2 is loaded and run to ensure that the game isn't corrupted by any data left in memory.

```
EI 1 REM ********************************
CI 2 REM *           REFLEX             *
RQ 3 REM *             by               *
UL 4 REM *        Bill Halsall          *
EC 5 REM * ---------------------------- *
IZ 6 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EO 7 REM ********************************
NN 8 REM
NK 10 REM LISTING 1 - TO MAKE BOOT TAPE
   OR OBJECT CODE ON DISK
EO 20 REM BASED ON ROUTINE ORIGINALLY
   PUBLISHED IN ANALOG MAGAZINE
BD 22 REM
RJ 24 REM ***  REFLEX STARTS HERE ***
BA 30 REM
SR 44 DIM DAT$(100),HEX(22):RESTORE 46:FO
   R X=0 TO 22:READ N:HEX(X)=N:NEXT X:PAS
   S=0:TOTAL=0:TRAP 62:? "CHECKING DATA"
CN 45 LINE=99
EL 46 DATA 0,1,2,3,4,5,6,7,8,9,0,0,0,0,0,
   0,0,10,11,12,13,14,15
BW 48 LINE=LINE+1:? LINE:READ DAT$:IF LEN
   (DAT$)<>90 THEN 76
BL 50 DATLIN=PEEK(183)+PEEK(184)*256:IF D
   ATLIN<>LINE THEN ? "MISSING";CHR$(253)
   :END
MA 52 FOR X=1 TO 89 STEP 2:D1=ASC(DAT$(X,
   X))-48:D2=ASC(DAT$(X+1,X+1))-48:BYTE=H
   EX(D1)*16+HEX(D2)
GR 54 IF PASS THEN PUT #1,BYTE:NEXT X:REA
   D CHKSUM:GOTO 48
BO 56 TOTAL=TOTAL+BYTE:IF TOTAL>999 THEN
   TOTAL=TOTAL-1000
TS 58 NEXT X:READ CHKSUM:IF TOTAL<>CHKSUM
    THEN 76
VQ 60 GOTO 48
TQ 62 IF PEEK(195)<>6 THEN ? "ERROR ";PEE
   K(195);CHR$(253):END
WX 64 IF PASS THEN FOR X=1 TO 6:PUT #1,0:
   NEXT X:CLOSE #1:END
PF 66 ? "(D)ISC OR (T)APE":GOSUB 80:IF K=
   ASC("D") THEN 70
RD 68 ? "READY CASSETTE AND PRESS RETURN"
   :OPEN #1,8,128,"C:":GOTO 74
IF 70 ? "READY DISC AND PRESS RETURN":GOS
   UB 80:IF K<>155 THEN 70
JR 72 OPEN #1,8,0,"D:REFLEX.OBJ"
HW 74 PASS=1:LINE=99:RESTORE 100:TRAP 62:
   GOTO 48
PT 76 ? "BAD DATA";CHR$(253):END
ZM 79 REM ***GET KEY ROUTINE***
GO 80 CLOSE #1:OPEN #1,4,0,"K:":GET #1,K:
   CLOSE #1:RETURN
WJ 100 DATA 000C00202820A9008D2F02A93C8D0
   2D3A9008DE702850EA9388DE802850FA928850
   AA920850B18604CF9240000,674
EV 101 DATA 000000704646207047003A0707070
   70707070707070741302000033232F32250010 1
   01A10100034292D25001010,938
XG 102 DATA A900AA9D003C9D003D9D003E9D003
   FE8D0F160A200BDC4209D503ABDD8209D8C3AE
   8E014D0EFA90185B0A90085,298
FR 103 DATA B1A200BD8402F011AD1FD0C903D00
   320BD24E8E002D0ECF0E8BD8402F0FB95B0A90
   0854DA9108D4D208D4E208D,20
ND 104 DATA 50208D5120A9118D5920A9168D582
   0600000000000000F2E5E6ECE5F00000000000
   000000000E2F900E2E9ECEC,202
QR 105 DATA 00E8E1ECF3E1ECEC000000A9008D2
   F02205A20A9388D07D4A9028D1DD0A9018D6F0
   2A9008D08D2A9038D0FD2A9,141
RL 106 DATA 308D3002A9208D310220CC24EAEAE
   AEAEAEAEAA200BD00E09D0038BD00E19D0039E
   8D0F1A200BD4A219D0038E8,683
NZ 107 DATA E030D0F5A9388DF402A93A8D2F026
   0000000000000000000070F1F3F7F7F7F00E0F
   0F8FCFEFEFE7F7F7F3F1F0F,246
DC 108 DATA 0700FEFEFEFCF8F0E000181818181
   8181818A900AA9D003AE8D0FAA000B9DB21AAA
   901200722C8C008D0F2A985,577
PC 109 DATA 8D083A8D0B3AA9458DE43A8DE73A2
   05A20A200BDE3219D203C9DDB3CBDFA219DC00
   2E8E009D0ECA200BD032295,808
```

Listing 1 - Main game

```
OI 110 DATA B29D00D0A93C9DC43D9D383EE8E00
   4D0EBA07684B6202D22602E31346B6FA6A9ACF
   EAAD66C3800000000000000,645
UL 111 DATA 60F0F0F0F0600000000000EC3E40F
   A4A3E400C447C68687E189D003A69019D013A6
   9019D143A69019D153A60A5,652
RV 112 DATA B71865B585B58D03D0A5B81865B68
   5B6A8A200BDE92199003FC8E8E010D0F460A5B
   9F00EC932F00BA5B9186904,588
YY 113 DATA 85B98D00D260A90085B98D00D28D0
   1D260A90285B98D00D2A9A88D01D260AD0AD22
   907F0F91869FD85B78D1ED0,271
ZX 114 DATA 205A2260206722AD0AD2290318690
   185B860206722AD0AD229031869FC85B86038A
   950E5B5900DAD0AD2290318,405
XR 115 DATA 690185B7205A2238A5B5E9AC900DA
   D0AD229031869FC85B7205A2238A918E5B6900
   3207D2238A5B6E9D6900320,264
ID 116 DATA 8B2260207A21A9008D1ED085B885B
   CAD0AD229021869FF85B760AE7802BD2123F02
   EAABD003AC901D026A9414C,152
HM 117 DATA 0722A5B1D008204324A6BC4C0E23A
   E7902BD2123F00DAABD003AC901D005A9814C0
   722600000000000AC346F00,850
HL 118 DATA A62E6B00A93100A00084BBB92123F
   02BAABD003AC901F023C941F004C981F009AD7
   802C5BBF014D00DAD7902C5,38
FH 119 DATA BBF00BA5BCC5BBF005A901200722C
   8C010D0C960AD07D02904D01DAD07D02902D01
   9AD0FD02904D00FAD0FD029,49
OO 120 DATA 02D00BAD0FD02901D007604C7A224
   C882220CE23A5B6300620A8234CD32220BB234
   CD322EE4E20AD4E20C91AD0,368
FN 121 DATA 08A9108D4E20EE4D2060EE5120AD5
   120C91AD008A9108D5120EE502060A9A88D01D
   2A000A90085BAA9018D1C02,898
SX 122 DATA AD1C02D0FBE6BAE6BAA5BA8D00D28
   DC802C944D0E6C8C003D0DDA9008D00D28D01D
   260A200B5BED01BBD840235,80
EX 123 DATA B0D028B5B3C990F005A9024C1B24A
   9001869FF95BED00AB5B3C968F014C990F010B
   5B31875BE95B39D01D0E8E0,241
LT 124 DATA 02D0C860A90095BE4C3624E6C3A5C
   325C2F00160A5B638E9609015A99038E5B6902
   BA5B53005A90B85BC60A907,810
KB 125 DATA 85BC60A5B538E972900CA98A38E5B
   5900AA90E85BC60A90A85BC60A90685BC60A5B
   538E972900CA98A38E5B590,669
FD 126 DATA 0AA90D85BC60A90985BC60A90585B
   C60A513C5BDF01485BDCE5920AD5920C90FD00
   8A9198D5920CE582060AD1F,751
ZP 127 DATA D0C903F0F9E6C0A4C0C007D004A00
   084C0B9E42485C1B9EB2485C2B9F2248D5D3A8
   DD12060020202010101017F,253
XG 128 DATA 3F1F7F3F1F0F00D1D2D3D4D5D620E
   C20206D20207A2120D32220EA2220FF2220602
   5203123200124201B22203C,945
AS 129 DATA 2220962220A224A200BD5820C910D
   01AE8E002D0F4A9008D00D28D01D2A9C88D1C0
   2AD1C02D0FB4CFC24A5C18D,194
HP 130 DATA 1C028D1ED0AD1C02D0FB4C0525000
   00000000000000000000000AD07D02906D0058
   5C44C7923A5C4D0F9A90185,713
FU 131 DATA C44C6B23230000000000000000000
   00000000000000000000000000000000000000
   00000000000000000000000,162
RE 132 DATA 00000000000000000000000000000
   00000000000000000000000000000000000000
   00000000000000000000000,162
RH 133 DATA 00000000000000000000000000000
   00000000000000000000000000000000000000
   00000000000000000000000,162
```

```
QK 1 REM *****************************
FA 2 REM * REFLEX Listing 2 TO RUN   *
DH 3 REM * DISK OBJECT CODE          *
QP 6 REM *****************************
BD 22 REM
HU 24 OPEN #1,4,0,"D:REFLEX.OBJ"
OL 25 POKE 850,7:POKE 852,0:POKE 853,32:P
   OKE 856,255:POKE 857,255
TB 28 X=USR(ADR("hhh█LV█"),16)
BO 30 CLOSE #1:X=USR(8232)
```

Listing 2 - Disk Loader

DAVE T'S DISCO

For the last time we visit Dave T's Disco for some more excellent music from your XL or XE. This tune is an ideal one for a title sequence or high score feature and like all the others it runs in the VBI so, if you can program around it, you should be able to get some great music into one of your programs.

Type in the listing and SAVE a copy before you play it (this is important). Type RUN and after a short initialisation the music will begin. You can now get rid of the program by typing NEW and, hey presto, the music still plays.

We hope you have enjoyed these visits to the disco, it shows you what great sounds that old 8-bit Atari can make!

```
WO 1 REM ********************************
PC 2 REM *        DAVE T's DISCO        *
QM 3 REM *        GUNSTAR Ver. 1.1      *
RU 4 REM *              by              *
NI 5 REM *         David P.Thomas       *
SS 6 REM * ---------------------------- *
KD 7 REM * PAGE 6 MAGAZINE - ENGLAND    *
WV 8 REM ********************************
NO 9 REM
AX 10 GRAPHICS 0:? "Patience ...."
OG 12 FOR A=0 TO 3:SOUND A,0,0,0:NEXT A
GL 13 POKE 53768,3+32
CI 14 POKE 53763,165
DG 15 FOR I=0 TO 100:POKE 120*256+I,0:NEX
   T I
QB 16 POKE 120*256+2,129:POKE 120*256+5,0
OV 17 POKE 120*256+6,166
PI 18 POKE 121*256,255
MZ 19 REM VBI INIT ADDRESS 25600
WL 20 FOR I=0 TO 10:READ Q:POKE 100*256+I
   ,Q:NEXT I
BO 30 DATA 162,6,169,0,169,7,32,92,228,10
   4,96
RL 40 I=0
QZ 50 READ Q:IF Q<>-1 THEN POKE 1536+I,Q:
   I=I+1:GOTO 50
GC 55 DATA 32,100,6
LB 60 DATA 174,0,120,202,142,0,120,142,1,
   210,174,2,120,202,142,2,120,142,5,210,
   173,9,120,105,3,141,9,120,141,0,210
GM 70 DATA 224,128,240,3,76,98,228
OQ 80 DATA 162,168,142,0,120,162,168,142,
   1,120,162,136,142,2,120,174,4,120,232,
   142,4,120,189,10,120,141,9,120
NL 90 DATA 189,50,120,141,4,210,224,16,24
   0,3,76,98,228
RF 100 DATA 162,0,142,4,120,76,98,228,-1
GD 109 I=0
VX 110 READ Q:IF Q<>-1 THEN POKE 1636+I,Q
   :I=I+1:GOTO 110
VN 120 DATA 174,5,120,232,142,5,120,224,0
   ,240,1,96
CG 129 DATA 162,0,142,5,120
ND 130 DATA 174,6,120,202,142,6,120,142,3
   ,210,224,165,240,1,96
HY 140 DATA 162,173,142,6,120,174,7,120,2
   32,142,7,120,189,0,118,141,108,6,189,0
   ,119
QV 141 DATA 141,2,210,105,1,141,6,210,224
   ,7,240,1,32,200,6,96
AM 150 DATA 162,0,142,7,120,96,-1
FO 160 I=0
IC 170 READ Q:IF Q<>-1 THEN POKE 1536+200
   +I,Q:I=I+1:GOTO 170
JK 180 DATA 173,0,121,105,1,141,0,121,141
   ,157,6,201,1,240,1,96,169,254,141,0,12
   1,141,157,6,141,9,210,169,165
EY 181 DATA 141,7,210,96,-1
TP 199 RESTORE 210
VE 200 REM DRUM(DOOF!) DATA
QY 210 FOR I=1 TO 16:READ Q:POKE 120*256+
   10+I,Q:NEXT I
XC 220 DATA 40,40,20,20,40,40,20,20
XE 230 DATA 40,40,20,20,40,40,20,20
QV 240 REM
QT 250 FOR I=1 TO 16:POKE 120*256+30+I,I:
   NEXT I
SJ 280 REM DRUM(WHITE NOISE) DATA
XO 290 FOR I=1 TO 16:READ Q:POKE 120*256+
   50+I,Q:NEXT I
DJ 300 DATA 20,20,100,100,0,0,100,100
GJ 310 DATA 0,0,100,100,20,20,100,100
BC 350 REM AND HERES ZA DATA FOR ZA TUNE
ZH 399 RESTORE 418
FM 400 I=1
DV 410 READ Q,W:IF Q<>-1 THEN POKE 118*25
   6+I,W:POKE 119*256+I,Q:I=I+1:GOTO 410
DP 418 DATA 191,1,191,1,127,1,191,1,135,1
   ,191,1,151,1,191,1
SS 419 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
AG 420 DATA 151,1,151,1,101,1,151,1,113,1
   ,151,1,128,1,151,1
RV 430 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
CK 440 DATA 191,1,191,1,127,1,191,1,135,1
   ,191,1,151,1,191,1
TA 459 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
AO 460 DATA 151,1,151,1,101,1,151,1,113,1
   ,151,1,128,1,151,1
SD 470 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
LM 500 DATA 191,5,127,1,135,1,151,1
KE 510 DATA 170,5,113,1,127,1,135,1
EL 520 DATA 151,5,101,1,113,1,127,1
KI 530 DATA 170,5,113,1,127,1,135,1
CY 540 DATA 191,1,191,1,127,1,191,1,135,1
   ,191,1,151,1,191,1
SA 550 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
AP 560 DATA 151,1,151,1,101,1,151,1,113,1
   ,151,1,128,1,151,1
SE 570 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
DH 571 DATA 191,1,191,1,127,1,191,1,135,1
   ,191,1,151,1,191,1
SK 572 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
BA 573 DATA 151,1,151,1,101,1,151,1,113,1
   ,151,1,128,1,151,1
SQ 574 DATA 171,1,171,1,113,1,171,1,127,1
   ,171,1,135,1,171,1
AM 600 DATA 191,2,127,1,135,1,127,1,135,1
   ,127,1,135,1
MU 610 DATA 171,2,113,1,127,1,113,1,127,1
   ,113,1,127,1
HC 620 DATA 151,2,101,1,113,1,101,1,113,1
   ,101,1,113,1
MY 630 DATA 171,2,113,1,127,1,113,1,127,1
   ,113,1,127,1
AU 640 DATA 191,2,127,1,135,1,127,1,135,1
   ,127,1,135,1
NC 650 DATA 171,2,113,1,127,1,113,1,127,1
   ,113,1,127,1
HK 660 DATA 151,2,101,1,113,1,101,1,113,1
   ,101,1,113,1
NG 670 DATA 171,2,113,1,127,1,113,1,127,1
   ,113,1,127,1
YZ 990 DATA -1,-1
NT 999 POKE 1698,I-1
LI 1000 GRAPHICS 0:SETCOLOR 2,0,0:SETCOLO
   R 1,0,12
LB 1010 ? " GUNSTAR HIGHSCORE/TITLE TUNE.
   "
NL 1020 ?
YV 1030 ? " Original Soundtrack complimen
   ts of..."
RX 1040 ? " Dave T (C) 1986."
NK 1110 ?
YC 1120 ? " Hello JOE!!"
NQ 1130 ?
NT 1140 ?
AZ 1200 VBI=USR(25600)
```

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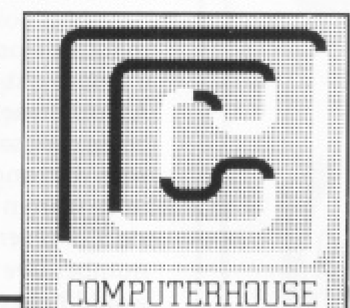
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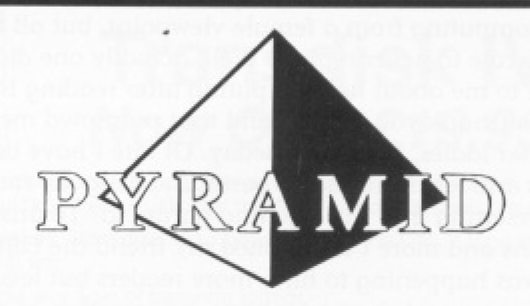
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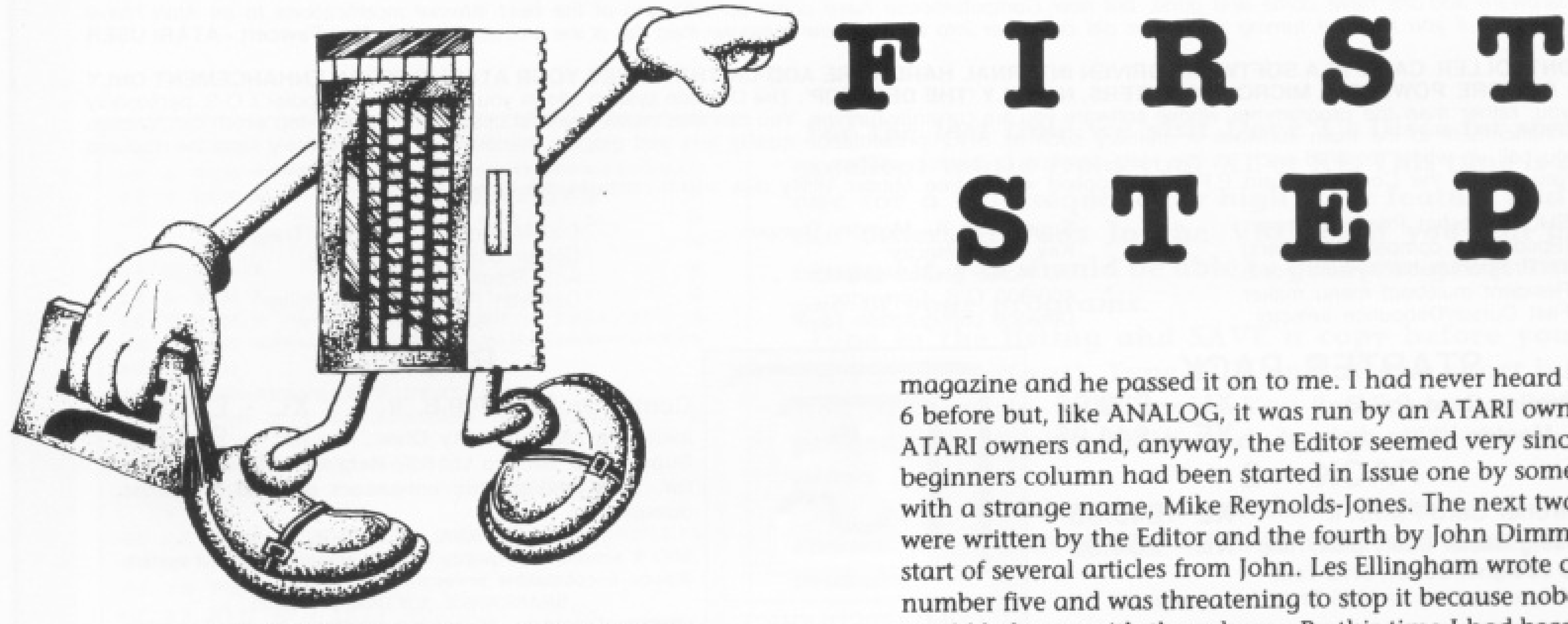
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THE LAST FIRST STEPS?

For this issue I have decided to forgo the usual format of First Steps and just let my fingers amble across the keyboard, who knows this might be the start of a different kind of column? I must first say sorry to those who were looking forward to more programming, I know there are still one or two out there because I did get a couple of letters, I am sure I did.

I did not get the letters that I had expected. I had wanted to write about computing from a female viewpoint, but all the ladies that I wrote to never replied. Well, actually one did. Linda Tinkler wrote to me about her computing after reading her name in my column (thank you Linda), and that prompted me to find out about other ladies. Maybe someday. Of late I have been receiving less and less mail. Is my postman losing my mail? Are my readers deserting me? Am I getting paranoid? To answer all these questions and more I telephoned my friend the Editor. The same thing was happening to him, more readers but less feed-back. During our usual short telephone conversation of an hour or more(!), we came to the conclusion that when PAGE 6 went on display in the high street shops people started to think that the magazine was just another 'names but no faces', Atari-disinterested, staff-written magazine from a press conglomerate. Maybe readers were thinking 'why contact people who earn their living just by the number of words they get printed' or 'PAGE 6 is now a large distribution, glossy magazine, they will not be interested in my letter'. How wrong they all are! I will now tell you how it really is. Are you sitting comfortably?

IN THE BEGINNING WAS ...

I bought my ATARI 400 in 1980, one of the first purchased in the UK. The computer magazines were few and far between, indeed many were just small sections inside electronics magazines. Those that were published would not touch ATARI articles. As for the shops, 'Oh yes, the video games thing? Sorry, you can only compute on that if you buy two special attachments' and this from a SILLY SHOP now one of the biggest ATARI dealers in the UK! Maplin, from whom I purchased my machine (but for them I would have an EXIDY or NASCOM), brought over ANALOG Computing magazine from America and brightened my life. Here was a magazine written, staffed and produced by authentic ATARI owners. A while later a friend of mine, one Peter Brown (still promising to continue his BMX articles!), had missed out on an issue of ANTIC, another imported magazine and the shop sent him an edition of some obscure british ATARI magazine and he passed it on to me. I had never heard of PAGE 6 before but, like ANALOG, it was run by an ATARI owner for ATARI owners and, anyway, the Editor seemed very sincere. A beginners column had been started in Issue one by some person with a strange name, Mike Reynolds-Jones. The next two issues were written by the Editor and the fourth by John Dimmer, the start of several articles from John. Les Ellingham wrote column number five and was threatening to stop it because nobody would help out with the column. By this time I had become enamoured with PAGE 6 and had written an article entitled 'What's wrong with fame?', trying to encourage all those readers who were to afraid to write an article for the magazine. In Issue six I had an article called 'Memories' and, in a rush of mad enthusiasm, wrote a 'First Steps' column promising that this would only be a one-off to tide the Editor over. We are now at Issue 35 and the only column I have missed since Issue 6 was due to lack of space!

THE ENTHUSIASTS

Let us look at some of the people in the ATARI world. September 1985 saw the first PAGE 6 stand at the PCW show. I was there and started talking to a man called Mike on the Software Express stand. Several minutes passed before I heard his surname. This was the same Mike Jones that started the column! I also met Peter Fellows, his co-partner in the firm. Peter and Mike were part of the Birmingham Users Group and started Software Express in December 1984. The firm expanded vastly from a stock of just £200 to one of the biggest in the UK, but the two originators are still fully dedicated to ATARI, and in a big way.

A lot of the longer established retailers you may buy from started with their own ATARIs and a user group such as BUG (or something similar), for instance Brian Davis of Ladbroke Computing, who tells funny tales about BUG. People like these are not out to rip you off, they are dedicated ATARI people just like you and me. Matthew Jones whose name appears often in PAGE 6, used to work for ATARI UK until Jack decided to trim the staffing levels wholesale. He is still a dedicated ATARI owner and PAGE 6 writer, in between university work and computing consultancy. Virtually all of the other writers for PAGE 6, such as the Davisons, Garry Francis and John Sweeney all have regular jobs and write about Atari because they fell in love with the machine early on. Then, of course, there are the 'occasional' finds like the brilliant Paul Lay who has contributed some of the best type-in games you will ever come across.

WHERE DID PAGE 6 COME IN?

Have you ever stopped to wonder how PAGE 6 was born, or did you just assume, as with most other magazines, that some publisher thought it was just a good way to make some money? Well, here's how it is. Back in 1982, the Editor, Les Ellingham, was asked by the Birmingham User Group to start a newsletter. He had high hopes of a proper magazine but was the only one with the fortitude to go all out for it. Most of the BUG members were afraid of the cost and would not back him, so PAGE 6 was conceived and reared solely by Les. I have been to his house in Stafford several times, and with hand on heart, I can tell you that the magazine is a full time job to the exclusion of many 'normal' pursuits, often taking 80 or more hours a week, and

ATARI and PAGE 6 are his life (along with his wife Sandy and son Sean). Les welcomes your letters and articles but when it comes to putting together the magazine he often has around twenty pages per issue more than he can print, so something must go by the board. Working so many hours a week also means that letters are often answered many weeks after they have been sent (if at all!). Many things cannot be done and pet projects are often delayed and this thing about people assuming that PAGE 6 is a big soul-less magazine means he has also had trouble obtaining staff. What is needed is a dedication and enthusiasm for ATARI computers and the wish to be part of a family business, not just the desire to pick up money for a 9-5 job. Such problems mean that minor items are delayed. I often have to wait weeks on a disk which, I am assured, "will be in the post this afternoon"!

ANOTHER EDITOR?

So much for glamorous life of an editor. I should know, I am one as well! I work full time for British Telecom. I write in my spare time and I started before there was such a thing as getting a cheque from PAGE 6 for the article. I am not a staff writer by any means. I have had articles published elsewhere and I still will if Les does not have the room and I think that the article is good enough. I have helped out with a user group magazine and a BBS. I do it because I enjoy it and I like to help others. I like to see my name and my article in print, I do not demand a cheque from Les. I could go on like this but I will not labour the point. PAGE 6 is a family run magazine dedicated to ATARI users, not a big magazine that is interested only in super machine code programs and arcade quality commercial games written by professionals, although Les does have a high standard and tries to improve the magazine with every issue. It is about you and me - the end user. To me, ANALOG lost that homely feeling when it went monthly and glossy. It took on several writers who appeared to write for cash rather than for the readers (one 'old timer' had a regular column that struggled to make headway and was suddenly ditched with no explanation). Can this be one of the reasons why ANALOG hit the rocks?

Maybe PAGE 6 appears that way to you but I can assure you it is not. We need your input to give us some idea of what you want to see. If there is no reader input then the Editor has to guess what to publish and those like me who want to write about things that interest us all, find it hard to know if anyone is really interested.

Sit down and think about this carefully, then write and give us some constructive views, you may even see your name in print! I will quote two captions from early issues used by Les and myself, 'What is wrong with fame?' and 'Don't relax, DO IT!'

POSTSCRIPT

The day that I finished this article I received a letter from Arthur Morris and I decided to add this paragraph. He told me that he would be very interested to find out just what people use their computers for, and so would I. We all know people who play games, write articles, use databases and spreadsheets, but there are many other uses (Les tells me of a couple of readers who have written programs to use their Atari's in a Curtain shop and a Garden Centre) so what unusual applications do you use your Atari for? Or what would you like to use it for, if only you knew how? Please write and let me know and I will try to compile a column about this subject especially for Arthur and every truly dedicated Atari enthusiast.

Write to **Mark Hutchinson,**
1, Hollymount,
Erinvale,
Finaghy,
Belfast, BT10 0GL

BALLB

Dave Hitchens brings you a made even more difficu you *can't* actually

Ballbender! is a single-player game perhaps best described as an inverse 'Blockbreaker' (my program on the Breakout theme which appeared in Issue 27 of Page 6) which invites you to amass points by directing a ball over a target whilst avoiding randomly sited bricks. It's advisable to use a strong joystick of the microswitched variety as the standard item may not survive!

STARTING TO PLAY

During the initialising run you may like to adjust sound and colour on your TV. The opening screen should appear a deep, but bright, blue and XE owners may need to advance the saturation control to achieve this. Once the main display appears you are presented with a number of options:

SELECT: This key displays the game options available. Press SELECT again to return to the main screen (other keys will not function whilst the menu is held).
OPTION: Changes the game option as required and displays it on the top wall.
HELP: This is, in essence, a practise mode without scoring facility and with fewer bricks - use it to become familiar with joystick control. Pressing the HELP key causes a flashing 'H' to appear on the top wall - press again if you decide against the option.

After selecting the game of your choice press START to set up the screen (to replay a game under the same option setting simply press the START key). Continuous 'music' now prompts you to press the joystick trigger to serve the ball.

GAINING CONTROL

To gain control you must first allow the ball to strike one of the two buffers situated on the left and right walls and which are brought into play by moving the joystick in the appropriate direction. Once in control you have the facility to 'bend' the ball in any direction (including diagonally) unless it collides with a brick. If this happens, you must reacquire control via the buffers as soon as possible to avoid the risk of penalty.

Note the use of the word 'bend'. You don't have complete control over the ball's flight but can only cause slight deviations from its programmed path. Nevertheless it is quite possible to guide the ball successfully by skilful joystick manipulation. Take advantage of the ball's existing motion when playing. Other things to look out for are as follows.

The Target: Unless the moving-target option is chosen, the target itself is not visible until struck but it's position is indicated by the green marker on the playfield. Centred hits score more points than glancing blows - always aim for accuracy! Points for a strike are only awarded if the player is in control of the ball - otherwise such hits incur penalties as described below.
Indicators: Two indicators below the wall (initially out of sight) record target strikes. The red one advances if the ball is out of control when the target is hit, the blue one advances if you have control. Should the red marker reach its limit of travel, the current game ends - hence the need to maintain control for as long as possible. When the blue marker reaches its limit it is reset, you receive a time bonus and the progress of the red indicator is retarded. Additionally you receive bonus points throughout a game if you are 'ahead' of the red indicator. Above the top wall is a timer which advances during game play with penalties resulting from ball to brick collisions. On reaching its limit the timer resets, additional bricks are introduced (up to a set maximum) and the red marker advanced.

Initially you are allowed four such passes after which the game ends, the last pass being indicated by the lower screen changing colour from green to red. Within certain limits, you are awarded an extra pass each time the blue marker resets.
Ball trajectory: A random choice of three trajectories is made at intervals during the game this being triggered each time the ball collides with a brick or after a certain number of boundary deflections have been recorded. Maintain vigilance!

OPTIONS DURING PLAY

The joystick trigger pauses and restarts play at any time without penalty. The ESCape key aborts a round via the 'end of game' screen returning the user to the main display. The scrolling hiscore lines keeps you advised of current targets but, if its presence distracts you, the SELECT key toggles it on and off. Of the game options presented, option 3 is probably the most satisfying and playable version. Options 1 and 2 are quite simple once the basic skills have been acquired and you may expect scores in the thousands with these versions. Remaining options will severely tax most players and scores in the hundreds are more likely. Option 7, although not a complete simulation of the game, does give an idea of the sort of speed easily attainable by VBI processing - note that you must still press the trigger after START to begin the demo.

TECHNICALITIES

A few notes on programming techniques may be of interest. Replacing frequently used constants by variables substantially reduced memory usage to some 24K. The reason that 48K is required is because most of the machine code accesses high-level memory directly and this, in 'Ballbender!' assumes

BENDER!

you a fast action game
iffi cult because in this one
ual ly control the ball!

RAMTOP to have a value of 160. A number of display screens are retained in memory to enable rapid switches to be made by the page-flipping technique. Since they all have a common format the basic design was duplicated using the machine code string CH$. This compacts the program and speeds up initial execution.

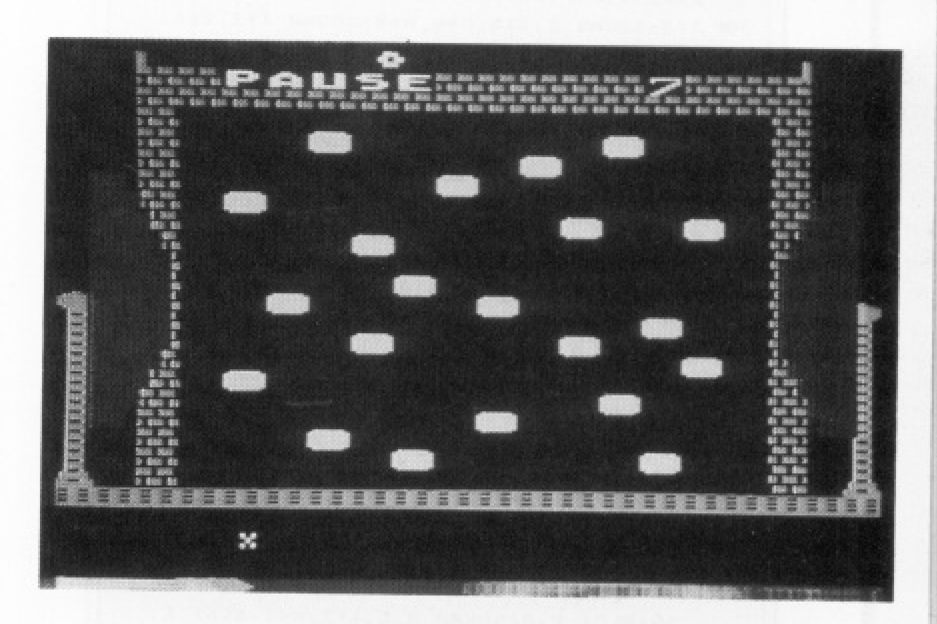
Three display list interrupts permit multiple use of PMG features but an interesting timing problem arose with DL12. Despite placing this on a blank scan line (allowing maximum processing time) the original code, which ran in a neat loop, consumed too much time and I had to resort to a string of unsightly load/stores which executes more quickly. If you inspect the code you will also notice the absence of the STA WAIT commands since the screen format does not require them.

Two VBI's are incorporated. The immediate VBI is brief and responsible only for the scrolling routine (which is linked to DL13). The deferred VBI is much longer and virtually runs the program with a little help from BASIC and the DLI's. It monitors joystick input, moves ball, target and buffers on request, generates the game's 4-channel sound effects and checks for collisions - all this 50 times per second! Because high-speed scoring is not a pre-requisite (as it was in 'Blockbreaker') I've left this menial task to BASIC along with a few non-time-critical checking routines.

You will notice that the main loop lies at the start of the program to optimise speed. You will also notice (I hope) that the display is much taller than a standard one. By creating a new display list we can make more effective use of the available space on the TV screen by expanding the vertical architecture of the program's display. Some 230 scan lines are used in this program - 20% more than in the standard layout. This might cause rolling on some TV's but it can usually be cured by a small adjustment to the horizontal hold on the TV.

```
WO 1 REM ******************************
YV 2 REM *      BALLBENDER c. 1987      *
MM 3 REM *      by David Hitchens       *
SQ 4 REM * -------------------------- *
KB 5 REM * PAGE 6 MAGAZINE - ENGLAND  *
WT 6 REM ******************************
NM 7 REM
GC 10 GOSUB 1000:GOSUB 2000:GOSUB 3000:GO
   TO 500
CG 29 REM  MAIN LOOP 
PW 30 IF PEEK(764)=28 THEN 350
RE 40 IF STRIG(0)=0 AND PEEK(1540)=0 THEN
    GOSUB 300
BG 45 IF PEEK(1540) THEN 60
PX 50 GOSUB 200:GOTO 40
GQ 60 IF PEEK(1562)>118 THEN POKE 1562,0:
   GOSUB 400:POKE 1550,PEEK(1550)+F:BR=BR
   +I:IF BR=F THEN 350
AE 65 POKE I,162-114*(BR=F-I)
LH 70 IF PEEK(19)<I+I THEN 90
YQ 80 N=PEEK(1549)-PEEK(1550):IF N<0 THEN
    N=0
YY 85 BNS=BNS+Q2+INT(N/2):POKE 19,0
WO 90 IF PEEK(1605)>180 THEN 350
AS 100 IF PEEK(1604)<180 THEN 120
YI 110 J=PEEK(1550)-F:POKE 1549,F:POKE 15
   50,J+F*(J<F):Q=Q+N256:Q2=Q2+X+X
OH 115 BR=BR-I+(BR<I):FOR N=15 TO 0 STEP
   -0.5:SOUND I,N,0,N:POKE 712,N*F:NEXT N
JR 120 IF PEEK(W)=F+I THEN J=PEEK(SCR+32)
   :POKE SCR+32,139+F*(J=139):J=I^I
BE 130 IF STRIG(0)=0 THEN POKE 1622,0:POK
   E 1540,0:J=0:GOSUB 210:GOSUB 750:POSIT
   ION F,0:? #X;"PAUSE":GOTO 250
```

continued overleaf



SPECIAL NOTE

The program is configured for a 48K (or greater) RAM system. In other words if you peek location 106 and a value other than '160' is returned this program will NOT run. The use of 'Typo' is strongly recommended since a large volume of machine code is contained within the data and control character statements. In any case save a couple of copies before running - just in case.

BALLBENDER!

```
WY 140 IF HELP THEN 30
DB 180 SCO=BNS+Q+PEEK(1549)*10:POSITION H
   -(SCO>9)-(SCO>99)-(SCO>999),0:? #X;SCO
OO 190 GOTO 30
VV 199 REM  SOUND CHANGE 
CW 200 RESTORE 770:POKE 182,13*RND(0):REA
   D D:POKE 53764,D:POKE 182,F*RND(0)+14:
   READ D:POKE 53762,D:RETURN
BJ 209 REM  BALL 
UV 210 POKE (PM1+384+PEEK(1537)),J:RETURN
WY 249 REM  PAUSE 
LN 250 IF STRIG(0)<>0 THEN GOSUB 200:GOTO
    250
OO 251 IF M3=I THEN POKE 1622,I
RC 252 J=N128:GOSUB 210:GOSUB 460:POSITIO
   N F,0:? #X;"0000":POKE 1540,I:GOTO 18
   0
FV 255 REM  TARGET SHAPES 
EJ 256 DATA 124,124,238,124,124
KQ 257 DATA 0,56,56,56,0
CB 258 DATA 60,126,231,126,60
JG 299 REM  SERVE BALL 
PQ 300 GOSUB 460:POKE 19,0
SF 305 FOR N=0 TO H+X STEP 0.5:SOUND 0,N,
   H,N:SOUND I,N,F+H,N:NEXT N:J=N128:GOSU
   B 210
VX 310 POKE 1539,I:POKE 1540,I:FOR N=H+X
   TO 0 STEP -0.5:SOUND 0,N,H,N:SOUND I,N
   ,F+H,N:NEXT N
ZQ 315 RETURN
AN 349 REM  END 
DR 350 POKE 208,80:POKE 1542,0:POKE 1540,
   0:J=0:GOSUB 210:POKE I,112:Q=115
VX 355 IF M3=I THEN POKE 1622,0:A=USR(ADR
   ("h♥ /MHJPZ♦"))
VQ 360 IF SCO>HSC(OPT) THEN HSC(OPT)=SCO:
   D=20*(OPT-I):A=USR(ADR(HSC$),D):Q=120
LI 365 POKE SCR+3,Q:POKE 89,Q:POSITION H,
   I:? #X;"0000":POSITION 11-(SCO>9)-(SCO
   >99)-(SCO>999),I:? #X;SCO:POKE 89,157
MN 370 SOUND I,215,F+X,X+X:SOUND I+I,216,
   F+X,X+X:POKE 53768,I
UD 380 POKE 19,252:A=USR(ADR("h T6 T
   PZ Pp♦"))
GB 390 GOSUB 460:GOSUB 750:GOTO 500
FT 399 REM  ADD BRICKS 
BU 400 POKE 77,0:Q1=Q1+I:IF M2=F-I THEN R
   ETURN
FO 401 IF Q1>F THEN RETURN
JM 402 RESTORE 420:FOR N=HELP TO I
KB 405 POKE 182,INT(20*RND(0))*2:READ D,E
   :LOCATE D,E,A:IF A<>0 THEN 405
VW 410 COLOR H:PLOT D,E:FOR A=15 TO 0 STE
   P -I:SOUND I,D+E,X+F,A:POKE 712,A:NEXT
    A:NEXT N:RETURN
DU 420 DATA 4,6,4,15,5,11,6,3,6,18,7,8,7,
   13,8,10,8,19,9,5,10,17,11,4,12,7,12,13
   ,13,3,13,16,14,12,14,19,15,7,15,14
ZP 449 REM  CLEAR BRICKS 
PR 450 COLOR 0:FOR D=F-I TO 19:FOR E=F TO
    15:PLOT E,D:SOUND 0,E,I+I,H+I:NEXT E:
   NEXT D:SOUND 0,0,0,0:RETURN
RZ 459 REM  SOUND OFF 
RW 460 FOR N=53760 TO 53768:POKE N,0:NEXT
    N
AB 465 RETURN
EM 499 REM  OPTIONS 
OQ 500 A=USR(ADR("h    ♥
   /  /   $ P H♥B V/♦")):HELP=0:
   POKE 732,0:COLOR 166:PLOT 11,0
CG 510 IF PEEK(W)=F-I THEN OPT=OPT+I-7*(O
   PT=H-I):POSITION H+X,0:? #X;CHR$(H+H+O
   PT):A=I^I
CH 520 M3=(OPT=F-I OR OPT=X OR OPT=H-I):M
   1=N256+(OPT=I+I OR OPT=F+I)+2*(M3=I):M
   2=I+(OPT>F-I)+(OPT>X):POKE 732,0
TL 530 POKE 209,M2:RESTORE M1:FOR N=M4-2
   TO M4+I+I:READ D:POKE N,D:NEXT N
DA 535 IF PEEK(W)=F+I THEN GOSUB 620
JF 540 IF PEEK(W)<>X THEN 570
VC 550 A=USR(ADR("h  V   $ ♦")):SC
   O=0:Q=0:Q1=0:Q2=0:BNS=0:POSITION F+I,0
   :? #X;"0000"
OU 560 BR=0:GOSUB 460:GOSUB 450:GOSUB 400
   :GOSUB 750
KG 565 IF M3=0 THEN COLOR 141:PLOT X+F,X+
   F:COLOR 143:PLOT X+F,11:POKE 53250,N12
   8:POKE 1607,N128
SR 566 IF M3=I THEN A=USR(ADR("hdm\/1mJ
   /5m♦/ U/JPZ♦"))
ID 567 IF M2=F-I THEN GOSUB 2200:PLOT X+F
   ,X+F+I
GQ 568 POKE 764,N256-I:GOTO 30
FT 570 IF PEEK(20)>N128 THEN GOSUB 200:PO
   KE 20,0
UI 575 IF PEEK(732)=17 THEN HELP=I-HELP:P
   OSITION 11,0:? #X;CHR$(166-94*HELP)
OB 590 GOTO 510
QZ 600 POKE 1540,0:J=0:GOSUB 210:GOTO 500
BT 620 K=SCR+3:IF PEEK(W)=F+I THEN POKE K
   ,125+32*(PEEK(K)=125):J=I^I^I
ZA 630 GOSUB 200:IF PEEK(K)=157 THEN RETU
   RN
ON 640 GOTO 620
PO 749 REM  INTRO SOUND 
MT 750 RESTORE 760:FOR N=53760 TO 53768:R
   EAD D:POKE N,D:NEXT N
DS 760 DATA 190,165,4,197,37,164,255,0,6
OT 770 DATA 15,18,23,31,37,47,63,75,95,12
   6,151,192,254,255,4,16,33,50,84
ZT 780 RETURN
EY 799 REM  SCROLL & DLI 
RX 800 DIM SCR$(11),SC1$(200),SC2$(200),S
   C3$(200),SC4$(P/F),SC5$(P/F),HSC(H):SC
   R$="h/ ♥ \d♦":SCV=141*N256
EX 802 SC4$="3%,%#4'/04)/.♥)8♥2%15♥♥4(%.♥
   34!24'42)'":SC5$="'/24'♥%3#♥♥() '(3'♥3
   %,%#4♥♥8!53%'♥42)'"
VF 805 SC1$="43♥4(%♥/04)/.3♥♥♥♥♥♥ballbend
   erA♥♥♥ ♥$!6)$♥()4#(%.3♥♥  ♥♥♥♥♥♥02%3
   3♥start♥4/♥#%').♥'!-%♥♥♥♥♥♥"
CX 806 SC1$(94)="press♥option♥to♥change♥p
   arameters♥♥♥♥♥select♥,)343♥4(%♥/04)/.3
   ":SC1$(78,78)=CHR$(34)
CV 810 SC2$="♥practise♥♥♥♥♥♥♥\current♥♥hi
   gh♥scores^♥♥♥♥♥♥option♥QZ♦♦♦♦♦♦♦♦♦♦♦op
   tion♥RZ♦♦♦♦♦♦♦♦♦♦♦option♥5Z♥♦♦♦♦♦"
KE 811 SC2$(99)="♥♥♥♥♥♥option♥TZ♦♦♦♦♦♦♦♦♦
   ♥♥option♥UZ♦♦♦♦♦♦♦♦♦♦♦option♥VZ♦♦♦♦♦♦♦
   ♥♥♥♥help♥keyZ♥practise♥♥♥♥♥♥♥\curr"
WN 812 SC3$="hortlyNNNNNNNNNNwelcome♥to♥B
   ballbenderAB NNNa♥fastMpaced♥sixMoption
   ♥game♥for♥one♥player♥requiring♥q"
VN 813 SC3$(99)="uick♥reflexes♥and♥a♥stro
   ng♥joystickANNNNNNNplease♥waitNNNscree
   n♥coming♥up♥shortlyNNNNNNNNNNwelco"
YB 815 RESTORE 850:FOR N=0 TO 125:READ D:
   POKE SCV+N,D:NEXT N:REM  VBI 
LV 820 FOR N=0 TO H:READ D,E:POKE SCV+D,E
   :NEXT N:POKE 207,F:HSC(H-I)=N128
RH 825 FOR N=0 TO 39:READ D:POKE SCR+N,D:
   NEXT N:REM  DISPLAY LIST 
UB 830 FOR N=0 TO 148:READ D:POKE SCR+50+
   N,D:NEXT N:REM  DLI 
AG 835 FOR N=I TO LEN(SC1$):POKE 142*N256
   +N,ASC(SC1$(N,N)):NEXT N
DS 840 FOR N=I TO LEN(SC2$):POKE 143*N256
   +N,ASC(SC2$(N,N)):NEXT N
LT 842 FOR N=I TO LEN(SC3$):POKE 138*N256
   +N,ASC(SC3$(N,N)):NEXT N
```

```
EK 843 FOR N=I TO LEN(SC4$):POKE 130*N256
   +N,ASC(SC4$(N,N)):NEXT N
IM 844 FOR N=I TO LEN(SC5$):POKE 131*N256
   +N,ASC(SC5$(N,N)):NEXT N
IS 845 FOR N=0 TO H+I:READ D,E:POKE D,E:N
   EXT N:A=USR(ADR(SCR$))
DQ 847 POSITION F,H:? #X;" one minute ":P
   OSITION F,X+F:? #X;"INITIALISING":POKE
    559,46:RETURN
CB 850 DATA 162,27,160,0,189,100,141,201,
   255,208,8,169,7,157,100,141,254,0,140,
   157,101,141,189,0,140,221,102,141,208
MR 852 DATA 5,169,0,157,0,140,222,100,141
   ,224,31,208,3,222,100,141,162,31,200,1
   92,2,208,208
SD 854 DATA 173,128,141,141,4,212,169,3,1
   41,65,6,198,207,208,37,169,2,133,207,1
   73,139,141,24,109,143,141
QK 856 DATA 141,139,141,141,196,2,205,141
   ,141,240,7,205,140,141,240,2,208,8,173
   ,143,141,73,254,141,143,141
KB 858 DATA 238,142,141,208,14,162,3,189,
   138,141,24,105,16,157,138,141,202,208,
   244,76,95,228
NK 859 DATA 127,7,131,7,129,141,133,173,1
   39,6,140,6,141,12,142,255,143,1
TH 860 DATA 112,198,128,135,6,6,6,6,6,6,6
   ,6,6,6,6,6,6,6,6,6,6,6,6,6,240,87,0,
   139,176,87,0,138,32,66,0,139,65,0,140
RC 865 DATA 72,206,65,6,173,65,6,240,104,
   201,1,240,26
LG 870 DATA 173,71,6,141,2,208, 169,10,14
   1,21,208,165,208,141,18,208,141,19,208
   ,169,232,141,23,208,104,64
MM 875 DATA 141,27,208,169,3,141,8,208,14
   1,9,208,169,40,141,0,208,169,0,141,18,
   208,141,19,208,169,118,141,20,208
YZ 880 DATA 169,56,141,21,208,169,170,141
   ,22,208,169,102,141,24,208,169,230,141
   ,25,208,173,66,6,141,23,208
CW 885 DATA 169,184,141,1,208,173,68,6,14
   1,2,208,173,69,6,141,3,208,104,64
YM 890 DATA 169,0,141,24,208,169,90,141,2
   2,208,169,200,141,23,208,169,20,141,25
   ,208,173,132,141,141,4,212
BA 892 DATA 165,1,141,10,212,141,26,208,1
   04,64
TS 895 DATA 559,0,560,0,561,140,512,50,51
   3,140,54286,192,53762,84,53764,254
BN 999 REM  MEMORY CONFIG/SAVER 
OY 1000 O=0:I=1:F=4:X=6:H=F+F:N128=128:N2
   56=256:W=53279:GRAPHICS 17:P=160:PMB1=
   P-H:CHB=P-12:VBI=P-16:SCRB=P-20
AI 1010 CH=CHB*N256:VB=VBI*N256:PM1=PMB1*
   N256:SCR=SCRB*N256:SOUND 0,0,0,0
RB 1050 DIM CH$(34):CH$="h}♥.K.Khh.Lhh.N"
   ┤ ♥1K.MHPyfL(NJPr◆":A=USR(ADR(CH$),224
   ,CHB)
IU 1060 DIM VB$(H+F),HSC$(19):VB$="h"◆ ♥}
   \ \d◆":HSC$="hhh(♥=.◆ 7 Hh◆H Pt◆"
EI 1070 POKE 89,135:POSITION F,H:? #X;"LO
   ADING DATA":POKE 708,H:POKE 712,N128:P
   OKE 40293,135:POKE I,O
SD 1090 GOSUB 750:GOSUB 800
TD 1099 REM  NEW CHARACTERS 
JF 1100 RESTORE 1130
TZ 1110 READ D:IF D=-I THEN 1200
GY 1120 FOR N=0 TO H-I:READ E:POKE CH+N+H
   *D,E:NEXT N:GOTO 1110
XX 1130 DATA 3,110,110,110,0,59,59,59,0
LO 1131 DATA 4,128,128,128,0,128,128,128,
   0
WE 1132 DATA 5,0,60,195,219,211,219,195,6
   0
JC 1133 DATA 6,238,238,238,0,187,187,187,
   0
```

```
JH 1134 DATA 7,60,36,60,60,60,36,60,60
OA 1135 DATA 8,126,255,255,255,255,255,25
   5,126
UP 1136 DATA 9,60,36,126,126,126,231,255,
   255
NX 1137 DATA 10,255,153,255,153,255,153,2
   55,255
XF 1138 DATA 11,24,126,255,255,255,255,12
   6,60
TJ 1139 DATA 12,0,0,255,255,255,255,0,0
UP 1140 DATA 13,56,56,84,84,170,170,198,1
   98
CZ 1141 DATA 15,170,170,84,84,56,56,0,0
EQ 1142 DATA 16,0,60,66,66,66,66,66,60
KX 1143 DATA 17,0,24,56,8,8,8,28,62
KY 1144 DATA 18,0,60,70,12,24,48,96,126
FY 1145 DATA 19,0,60,66,2,12,2,66,60
RD 1146 DATA 20,0,12,20,36,68,126,4,4
FO 1147 DATA 21,0,126,64,124,2,2,66,60
IM 1148 DATA 22,0,12,24,48,124,66,66,60
YY 1149 DATA 23,0,126,66,6,12,24,48,96
XY 1150 DATA 24,0,60,66,66,60,66,66,60
RQ 1151 DATA 25,0,60,66,66,62,12,24,48
EY 1160 DATA -1
HS 1199 REM  VBI 
VI 1200 N=-I:RESTORE 1230
CL 1210 READ D:IF D=-I THEN RETURN
OW 1220 N=N+I:POKE VB+N,D:GOTO 1210
QF 1230 DATA 173,4,6,240,76
MH 1235 DATA 173,0,6,201,72,176,8,169,1,1
   41,2,6,141,5,6
QF 1240 DATA 173,0,6,201,185,144,8,169,25
   5,141,2,6,141,5,6
SY 1245 DATA 173,1,6,201,16,176,8,169,255
   ,141,3,6,141,5,6
MV 1250 DATA 173,1,6,201,92,144,11,169,1,
   141,3,6,141,5,6,206,33,6,173,33,6,208,
   8,32,36,6,169,5,141,33,6
HY 1255 DATA 173,11,208,240,39
GT 1260 DATA 162,255,201,4,240,18,141,6,6
   ,141,8,6,201,2,240,2,162,1,142,2,6,24,
   144,15
BM 1262 DATA 162,0,173,6,6,208,1,232,254,
   13,6,232,142,15,6
SF 1265 DATA 173,3,208,240,57,201,4,240,5
   3,201,8,240,49
BL 1270 DATA 162,255,173,0,6,41,6,240,17,
   201,6,240,11,173,3,6,73,254,141,3,6,24
   ,144,5,162,1,142,2,6,142,25,6
SF 1275 DATA 169,0,141,6,6,32,36,6,173,26
   ,6,24,105,4,141,26,6
HR 1280 DATA 173,6,6,240,51,169,54,141,11
   ,6,169,187,141,12,6
VD 1285 DATA 206,7,6,208,36,169,2,141,7,6
FO 1290 DATA 173,120,2,74,176,5,72,32,100
   ,6,104,74,176,5,72,32,119,6,104,74,176
   ,3,206,0,6,74,176,3,238,0,6
LH 1295 DATA 173,4,6,240,51
HC 1300 DATA 173,0,6,24,109,2,6,141,0,6,1
   41,7,208,206,34,6,208,238,173,10,6,141
   ,34,6
QC 1305 DATA 173,3,6,201,255,240,6
VL 1310 DATA 32,100,6,24,144,3
EE 1315 DATA 32,119,6
PW 1320 DATA 206,35,6,208,235,173,9,6,141
   ,35,6,141,30,208
WJ 1325 DATA 173,6,6,208,53,173,120,2,201
   ,15,208,13,169,54,141,11,6,169,187,141
   ,12,6,24,144,33
TU 1330 DATA 173,120,2,74,74,74,176,12
XP 1335 DATA 173,12,6,201,179,144,18,206,
   12,6,176,13
FM 1340 DATA 74,176,10,173,11,6,201,63,17
   6,3,238,11,6
AE 1345 DATA 173,11,6,141,0,208,173,12,6,
   141,1,208
```

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BALLBENDER!

```
EA 1350 DATA 162,2,189,12,6,10,10,24,105,
    66,157,67,6,202,208,242,173,26,6,24,10
    5,66,141,70,6,141,3,208
FY 1355 DATA 165,0,240,6,173,196,2,141,0,
    210,165,20,141,66,6,169,1,141,8,208,14
    1,9,208,173,71,6,141,2,208
TH 1360 DATA 174,15,6,208,7,173,20,6,208,
    30,240,105
QM 1365 DATA 189,15,6,141,19,6,141,18,6,1
    41,20,6,169,0,141,15,6,189,22,6,141,22
    ,6,169,25,141,21,6
PL 1370 DATA 173,18,6,141,1,210,41,79,141
    ,194,2
HX 1375 DATA 173,19,6,240,18,173,21,6,24,
    105,3,141,21,6,201,34,208,45,169,0,141
    ,19,6
YQ 1380 DATA 173,21,6,56,233,3,141,21,6,2
    01,25,208,27
BF 1385 DATA 162,1,142,19,6,206,18,6,172,
    18,6,204,22,6,208,11,202,138,141,20,6,
    141,1,210,141,194,2,141,0,210
GS 1390 DATA 173,5,6,208,7,173,74,6,208,2
    3,240,45,169,93,141,4,210,169,212,141,
    74,6,141,75,6,169,0,141,5,6,238,26,6
CV 1395 DATA 173,75,6,56,233,10,141,75,6,
    173,75,6,201,192,208,5,169,0,141,74,6,
    141,5,210
IR 1400 DATA 173,8,6,208,7,173,76,6,208,1
    9,240,36,169,14,141,77,6,141,76,6,169,
    0,141,8,6,169,84,133,208
AW 1405 DATA 206,77,6,173,77,6,208,5,169,
    0,141,76,6,141,2,210,141,3,210
JV 1410 DATA 173,25,6,208,7,173,78,6,208,
    27,240,46,173,10,210,41,15,141,6,210,1
    69,48,141,79,6,141,78,6
FW 1415 DATA 169,0,141,25,6,169,80,133,20
    8,206,79,6,206,79,6,173,79,6,201,32,20
    8,5,169,0,141,78,6,141,7,210
CB 1417 DATA 173,20,6,208,10,173,86,6,240
    ,5,169,200,141,194,2
FI 1420 DATA 173,86,6,208,3,76,98,228,206
    ,87,6,208,248,206,88,6,208,35
WI 1430 DATA 173,10,210,41,15,105,15,141,
    88,6,162,1,160,1,173,10,210,41,3,74,14
    4,2,162,255,142,94,6,74,144,2
EJ 1440 DATA 160,255,140,95,6,169,3,141,8
    7,6,173,92,6,201,72,176,5,162,1,142,94
    ,6,201,178,144,5,162,255,142,94,6
KR 1450 DATA 24,109,94,6,141,92,6,141,71,
    6,173,93,6,201,17,176,5,162,255,142,95
    ,6,201,87,144,5,162,1,142,95,6,173,95
PA 1460 DATA 6,201,255,240,24,162,6,172,9
    3,6,177,205,136,145,205,200,200,202,20
    8,246,206,93,6,206,96,6,76,98,228
BW 1470 DATA 162,6,172,96,6,177,205,200,1
    45,205,136,136,202,208,246,238,93,6,23
    8,96,6,76,98,228
EO 1500 DATA -1
AV 1999 REM  SCREEN LAYOUT
AN 2000 POKE 89,157
KM 2010 RESTORE 2050
ZD 2020 FOR N=O TO H:READ A,D,E,J,K:COLOR
     A:PLOT D,E:DRAWTO J,K:NEXT N
YL 2030 FOR N=I TO H-I:READ A,D,E:COLOR A
    :PLOT D,E:NEXT N
WS 2050 DATA 166,2,20,2,1,166,2,1,17,1,16
    6,2,0,18,0,163,17,2,17,20,164,18,0,18,
    20
IM 2060 DATA 167,0,12,0,19,167,19,12,19,1
    9,170,0,21,19,21,48,5,0,8,0
ZN 2070 DATA 169,0,20,169,19,20,171,0,11,
    171,19,11,172,1,11,172,18,11,17,14,0
GR 2080 A=USR(ADR(CH$),157,125)
FI 2090 POKE 89,125:POSITION F,O:? #X;"&&
    &OPTIONS&":POSITION F,F-I:? #X;"N BALL
     TARGET"
DB 2100 POSITION F,6:? #X;"1 slow large":
    POSITION F,H:? #X;"2 slow small":POSIT
    ION F,X+F:? #X;"3 slow move"
FH 2110 POSITION F,H+F:? #X;"4 fast large
    ":POSITION F,14:? #X;"5 fast small":PO
    SITION F,H+H:? #X;"6 fast move"
FT 2120 POSITION F,18:? #6;"7 wow: demo"
AZ 2130 A=USR(ADR(CH$),157,120)
VR 2140 POKE 89,120:POSITION H,X:? #6;"GA
    ME":POSITION H,H+I:? #6;"OVER":POSITIO
    N I,O:? #X;"PAUSE FOR THOUGHT!"
WI 2145 POSITION X+I,I:? #X;" 0000 "
CD 2150 RESTORE 2155:COLOR H:FOR N=I TO H
    +F:READ D,E:PLOT D,E:NEXT N
MV 2155 DATA 9,3,10,3,7,4,12,4,6,7,13,7,6
    ,8,13,8,7,11,12,11,9,12,10,12
WU 2160 A=USR(ADR(CH$),120,115)
UF 2170 POSITION X,15:? #X;"you have":POS
    ITION X+I,17:? #X;"a new":POSITION X,
    19:? #X;"hiscore!"
DF 2180 COLOR H:FOR N=15 TO 19 STEP I+I:P
    LOT F,N:PLOT 15,N:NEXT N
AM 2190 POKE 89,157:COLOR 141:PLOT X+F,X+
    F:COLOR 143:PLOT X+F,11
BT 2200 COLOR H:RESTORE 420:FOR N=O TO 19
    :READ D,E:PLOT D,E:NEXT N
AG 2300 RETURN
MP 3000 REM  PMG STUFF & VARIABLE TABLE
LJ 3010 RESTORE 3500:FOR N=1536 TO 1606:R
    EAD D:POKE N,D:NEXT N:POKE 1622,O
DX 3020 FOR N=1636 TO 1673:READ D:POKE N,
    D:NEXT N
ME 3024 RESTORE 3600
EH 3025 FOR K=O TO N128 STEP N128:FOR N=O
     TO 48 STEP F:READ D:FOR J=O TO 3:POKE
     PM1+540+N+J+K,D:NEXT J:NEXT N:NEXT K
KC 3030 FOR N=53252 TO 53257:READ D:POKE
    N,D:NEXT N
TE 3120 M4=PM1+779+40
NA 3140 RESTORE 3800
ZC 3150 FOR N=O TO 13:READ D,E:POKE PM1+8
    70+D,E:NEXT N
HF 3160 FOR N=0 TO N128 STEP N128:FOR D=O
     TO X:POKE PM1+N+613+D,N256-I:NEXT D:N
    EXT N
EB 3170 FOR N=O TO H:READ D,E:POKE D,E:NE
    XT N
GG 3180 RESTORE 3900:FOR N=704 TO 712:REA
    D D:POKE N,D:NEXT N:OPT=I
VZ 3190 POKE 756,148:POKE 53277,F-I:A=USR
    (ADR(VB$))
AF 3200 RETURN
XF 3500 DATA 100,50,1,1,0,0,0,2,0,1,1,54,
    187,0,0,0,175,207,0,0,0,0,0,160,192,0,
    0,0,0,0,0,0,0,10,1,1
ET 3510 DATA 166,209,164,209,173,10,210,2
    01,85,144,10,201,170,162,1,160,2,144,2
    ,232,136,142,9,6,140,10,6,96
YG 3520 DATA 0,3,0,8,0,0,0
VI 3530 DATA 162,2,172,1,6,177,203,136,14
    5,203,200,200,202,208,246,206,1,6,96
BO 3540 DATA 162,2,172,1,6,177,203,200,14
    5,203,136,136,202,208,246,238,1,6,96
XA 3600 DATA 240,248,252,254,255,255,255,
    255,255,254,252,248,240
KB 3610 DATA 15,31,63,127,255,255,255,255
    ,255,127,63,31,15,64,191,0,0,1,1
YI 3800 DATA 2,56,3,40,4,56,30,56,31,108,
    32,56,127,40,128,16,129,40,-481,15,-48
    0,15,-479,15,-478,15,-436,128
MD 3810 DATA 0,0,203,128,204,153,205,0,20
    6,155,208,80,209,1,623,0,54279,152
RV 3900 DATA 20,20,0,232,8,136,20,196,0
```

CONTACT

FOR SALE

XL SYSTEM: 800XL, 1050 Disk Drive, 1029 Printer, over 100 disks in lockable box, printer paper, joystick, books and manuals. £250. Contact Stefan on (0407) 710 058 after 6 pm

XL SYSTEM: Atari 800XL £40, 810 Happy disk drive with S/W £80, 1027 printer £45, original S/W, Sparta DOS, Atari Writer, Tape-to-disk, Ultimon and many more plus lots of games, all cheap. Phone 0600-6144

XL SYSTEM: 800XL with 1050 disk drive plus U.S. Doubler, over 100 games and utilities £165. Tel 0742 489564 or write to: D. Roberts, 22, Inkersall Drive, Westfield Est., Mosborough, Sheffield S19 5NN

XL SYSTEM: 800XL, 1050 disk drive, extensive software, cabinet and mags, all for £150 - Tel Ian on Wickford (0268) 732929 after 6 pm

ATARI 800: 48K plus 410 cassette. Also Atari 800, 48K plus 810 disk drive fitted with Archiver. No realistic offer refused. Write for full details to: M. Preston, 6 Borrowdale Cl., Earl Shilton, Leicester LE9 7GR

1029 PRINTER: Fitted with Font 4 chip. Price: £100, buyer collects. Telephone 091 586 9425

ATARI DISKS: Xlent software's '10 Print' for 1029 printer £8, Boulderdash Construction Kit £8, Leaderboard Tournament Disk £5. Also some issues of Antic and Analog magazines at £1.50 each. Telephone 091 - 5869425

MAGAZINES: Antic Vol.1 No.2 thru Vol.6 No.6 (58 issues) £26. Analog Issues 7 thru 57 (2 missing) £25. Approx 70 cassettes, some original games plus programs, some public domain, some blank! £20. L.K. Smith (04947) 21032

XL SYSTEM: 800XL with 256K RAM (XE compatible) £80. Also original Atari 800 with 288K RAM (Axlon type) £80. Many magazines and blank disks - phone for details. Ian (0633) 880714

PRINTER: 1029 £70. Also Basic XE cartridge £30, 2-bit sampler £15 o.n.o., and various games on disk £5 each. Op. Sys manual, De-Re Atari and Compute's memory map - offers? Telephone: Iain on Southend (0702) 218455 after 7pm

INTERFACE: 850, complete with power pack ,printer cable and manual. Virtually unused, £80 o.n.o. Atari 800 & 410 recorder, extremely reliable, including many tapes £60. Tel: (0773) 44525

BASIC XL ROM CARTRIDGE: By OSS with runtime disk & manual for £29.95 complete, also various cassette games (10) for £9.50 the lot. ZORK I (disk) £3.95, all plus p&p. Phone 0875 52963 after 6pm

XL SYSTEM: 800XL, 1050 disk drive, 1010 cassette deck, 1020 plotter, 1027 printer NLQ, Touch Tablet with Atari Artist, 16 ROM games, 132 disks most with games on, Pilot and Music Composer on ROM. Loads of cassette games plus foreign language tapes. System is not boxed but is in good working condition. Total cost must have exceeded £1000. Will sell for £225, no offers. Any inspection. Buyer must collect - Muswell Hill area, London, N10. Tel. 01-883-2616

130XE: Hardly used, 1050 disk drive, 1010 program recorder, 1020 colour printer/plotter - all boxed with leads. Plus loads of software on cartridge, disk and cassette. Value exceeds £800, will sell for £300 o.n.o. but buyer must arrange collection. Contact Sunil (evenings only please) on 0532-824874

XL SYSTEM: 800/48K plus 1050 disk drive and Philips colour monitor, £280. Phone 0634-666370

XL SYSTEM: 800XL with 1050 disk drive, 1027 printer and various disks and books. £200 o.v.n.o. (West Sussex) 0403 81 4251

ST SYSTEM: 520STFM including mouse, joystick and £400 worth of software, 1 Meg. upgrade, one years warranty. Still in box, unwanted gift. Absolute bargain at £370. Phone (024 027) 310 evenings

130XE SYSTEM: I'm moving so the following must go. 130XE, boxed (still under guarantee) also Atari cassette deck, joysticks, 'Atari User' and 'Page 6' back issues. Best offers on everything to clear. Phone Matthew on 0273-513671

KONIX SPEEDKING JOYSTICK: Unwanted birthday present, unused and with guarantee. Was £12.99, sell for £9.00. Cheques made payable to D.Betts, 8 Healey, Lakeside, Tamworth, Staffs. Tel. Tamworth 287505

MICROSTUFFER: 64k printer buffer, works with any micro and printer with Centronics interface. Boxed, as new, perfect working order, only 6 months old. £30. Phone Mike Doyle on 0332 810785 (Derby)

XL SYSTEM: 800XL, 1050 disk drive, joystick and games disks. Also new boxed games - The Pawn & Jewels Of Darkness. £160 o.n.o. Ring Cambridge 811870 and ask for Sandra. (weekdays only)

XE SYSTEM: 130XE and two 1050 disk drives fitted with laser chips. Printer interface, books, Atari-Writer, Mini-Office and games, £260. Tel. Leeds (0532) 863253 evenings

XL SYSTEM: 800 XL, 1050 disk drive with US Doubler, XC12 recorder, (all boxed and as new), Assembler Editor cartridge, games, books and mags, £200. Tel Mark after 6pm on 0538-387781

XL SYSTEM: 800XL, 1050 disk drive, data recorder, joystick, many disk-based programs with disk box. Sell for £150. Contact Trevor Simms, 55/6, Kingswood Road, Moseley, Birmingham B13 9AW

XL SYSTEM: 800XL, 1050 disk drive, Brother M1009 printer, Grafix AT interface, 100 plus disks, books and mags. £300 o.v.n.o. Phone (0538) 753137

PRINTER: 1027 printer as new, with Atari-Writer Plus and Mini-Office II, £80. Tel. 01-854-9998

XL SYSTEM: 800XL, 1029 printer, disk drive, replay sampler, Touch Tablet with Atari Artist, joysticks, manuals, software, many magazines, 50 cassette games and Designers Pencil (ROM) included, unused T/Pursuit plus extras. All good condition, £350 o.n.o. Tel: Liz on Wolverhampton 880978 during working hours

SUPER PHONE!: 41 memories, loud-speaking, hands-free or manual, clock, call-timer, L.C.D. display and more! (cost £185). Boxed, unused. Swap for Atari system with cash adjustment either way. Tel. 091-226 0835

FLIGHT SIMULATORS: Both the Flight Simulator books for FS2 (Flight Sim II) also both the maps and the flight ref. card, still in the FS2 box, all for £5. J.M.Donald, 18 Newbyres Ave, Gorebridge, Midlothian, Scotland

DISK DRIVE: 1050 fitted with Happy Board and U.S.Doubler plus switch to turn Happy off and Doubler on, write protect switch and fitted heat sink to cut down heat build up. Complete with 25 blank disks. Cost over £230, will sell for £170 o.n.o. First come first served! J.M.Donald, 18 Newbyres Ave, Gorebridge, Midlothian, Scotland

ST SYSTEM: 520STFM with built-in disk drive, mouse, mouse-mat, dust cover, lockable disk box with lots of software, joystick, word processor/spell checker, manuals. All in immaculate condition and still under guarantee. £265 (no offers). Tel. 0342 (East Grinstead) 27072

XL SYSTEM: 800XL and 1010 data recorder (broken pause key) plus Euromax Professional joystick with autofire and over £140 worth of software. Sell for £135 or swap for 130XE plus XC12 data recorder. Phone Bilston (0902) 43309 after 6 pm

XE SYSTEM: 130XE, 1050 disk drive, 1010 recorder, 1029 printer, touch tablet, lots of books and mags, 67 disks, 25 tapes, 4 cartridges (all originals). £275 o.n.o. Tel 0507 605244

MEGA ST: 'ST2' computer system consisting of keyboard, disk drive, mouse and monitor. Only used for three times. Boxed as new, £575 o.n.o. Will also include within this price a Quickshot joystick and 2 boxes of 3.5" disks. Call Tony on (0525) 376515

TAPE DECK: 1010 Atari program recorder, perfect five star condition (very careful owner) with power lead, computer connection lead, instructions and original box. Offers to Mr. C.M. Fippard, 12, First Avenue, Grantham, Lincs, NG31 9TN

BOOKS: De-Re Atari in ring binder £10 post free. Master Memory Map (including many useful peeks and pokes) £4 post free. Phone 0423 879533 after 6 pm or weekends

1029 PRINTER: Atari 1029 printer and 10-PRINT, Atariwriter and dump utilities - a bargain at £90. Ring Martin on 0527 402788

XL SYSTEM: 800XL, 1050 disk drive, 1010 tape deck, DOS 2.5, Rev. C Basic, software and mags. Buyer collects or pays postage. Quick sale, £150. Phone Wolverhampton (0902) 745752

ST DISK DRIVES: AS&T FD600 twin 1 meg drives for sale. Regularly serviced. £150. Tel. Peter Brown on 0232 246113 (office hours) or 09603 41811 (evenings)

MAGS FOR SALE: ANALOG from Issue 1 to July '87 (54 mags), ANTIC from Issue 1 to July '87 (57 mags), PAGE 6 from Issue 1 to Nov/Dec '87 (30 mags), ATARI USER from Issue 1 to May '88 (37 mags), MONITOR from Issue 3 to 19 (17 mags), approx 40 Issues of Compute! All for £100. Buyer collects. Phone Geoff 051 424 4243

BOOKS: Compute!'s Personal Telecomputing, Atari Games, Revised Mapping The Atari, Machine Language, 1st, 2nd and 3rd Books of Atari, Atari Graphics books 1 & 2, Atari 130XE M/L for the Absolute Beginner, Atari Disk Guide, Atari Sound and Graphics, Atari Games and Recreation, 6502 M/L for beginners, Atari Basic, Atari Software Protection Techniques 1 & 2, Atari Assembler, Programming 6502, 6502 Assembly Language Subroutines, Analog Compendium, Best of Antic, Atari Pilot, Programming Your Atari, 130XE Handbook, Visicalc for Atari (25 books, all immaculate). ALL for £55, Buyer collects. Phone Geoff 051 424 4243

COMPLETE SYSTEM: 800XL (Rev. C) internal 256k, 1050 disk drive with Lazer Plus write protect switch, 410 recorder (some blank tapes) 2 Quickshot 2 Turbo joysticks, 2 100 capacity disk boxes plus 150 disks, lots of magazines and books, Buyer collects. £350. Phone Howard 0423 879533 after 6 pm or weekends

XL SYSTEM: 800XL, 1050 disk drive with Doubler, 1010 tape deck, touch tablet, Graphix AT interface, 100 disks, cassettes and ROMs. £200 the lot. Phone Peter on 0495 245327 after 5 pm

XL SYSTEM: 256k 800XL, 1050 drive, 410 recorder, 1029 printer, joystick, books, mags, software. £250 o.n.o. Phone 061 682 4165

XE SYSTEM: 130XE, 1050 disk drive, 1029 printer, XC12 tape deck, software, books, manuals and mags. All boxed, only £250 o.n.o. Phone 024368 2489

XL SYSTEM: 800XL, 48k 800, 810 with Archiver, 1050 drive, 1029 printer, 822 printer, WS2000 modem with lead, 410 recorder, trakball, software, mags. £500. Phone David on 096 277 3360

XL SYSTEM: 800XL, 1010 recorder, joystick and over £300 worth of software. Will sell for £200 o.n.o. Tel. Jahid on 01 455 4718

ST MOUSE/JOYSTICK SWITCHER: Enables you to have a mouse and TWO joysticks attached to your ST plus 1 metre extension lead. Contact K.R. Thompson, NENTHOLME, Alston, Cumbria, CA9 3JQ

XL SYSTEM: 800XL, 1050 disk drive, 1010 cassette, touch tablet, software, full set of Atari User, some Page 6, 9 manuals. £225 o.n.o. Contact Lee, 17, Lapwing Road, Luton, Beds. Tel 0582 609408

ATARI 400: With Basic cartridge and manual, original box, plug and transformer. £30. Buyer must pay delivery. Ring Sheffield (0742) 430772

1027 PRINTER: Complete with AtariWriter disk, dust cover and all original fittings and packing. Hardly used. £75. Plymouth (0752) 812496

ST UPGRADE: 1 meg ST/M/FM upgrade for sale. Will fit. £75. Phone Mark on (0495) 272358

WANTED

GRAPHICS: Printshop Graphic Icons, Atari Artist and Fun With Art Pictures, and Antic and Analog monthly disks. Write to M. Preston, 6 Borrowdale Close, Earl Shilton, Leicester, LE9 7GR

MADNESS: Will swap my Atari 1029 Printer, boxed as new, unwanted gift plus loads of paper, Atari Writer and Mini-Office II for a Commodore 64 with cassette deck. Tel. (0942) 728979 or write to Mr. G. Hindley, 6, Rushmoor Ave., Ashton-in-Makerfield, Nr. Wigan, Gtr. Manchester WN4 8XH

XL/XE SECONDHAND COMPUTERS: In working order. I will pay £40 each. Please write to Robert Stuart, 22 Lewis Wynd, Broomlands, Irvine, Strathclyde KA11 1HL

HITCH-HIKERS FANS!: Can anyone let me have a copy of the first episode of the Radio 4 series? Call Stewart on (04574) 4157

DISK DRIVE: 1050 working order. Also copies of magazines - Antic, Analog, Compute, Monitor 1-14 and Page 6 1-19. A loan for photocopying considered. (Postage will be refunded). Please write to J. Adams, 192 Exeter Street, Plymouth PL4 0NQ

'YES' MUSIC BOOK: Does anyone out there have a copy of the music book for the album '90125' by Yes? I'm trying to create some of the music on my computer and it's turning out to be very, very hard! Contact Sunil (evenings only please) on 0532-824874

DISK DRIVE: 1050 plus back issues of PAGE 6 (1-15) and any other mags and books. Loan considered (postage refunded). Please send list to: J. Adams, 192 Exeter St., Plymouth PL4 0NQ

ST SYSTEM: Wanted in very good condition with built-in disk drive, TV modulator and games. Swap for 65XE, data recorder, CX40 joystick and games, mostly new ones, boxed and in very good condition PLUS Atari new style 2600 console with 14 games, all leads and boxed, in very good condition. Phone (0422) 57539

MONITOR: Issues 1 and 2 of Monitor magazine wanted. Top price paid. Inform John Robinson on 06576 363

INTERFACE: RS232 Interface wanted for 130XE in the £20 - £50 region. Kristofer Andersson, P.L. 7026, 444 60 Stenungsund, Sweden

DE RE ATARI: Wanted, swap for 800XL, no transformer or leads. Also PL65 users for penpals, all letters answered. Phone (0438) 359714 or write to Simon Trew, 322, York Road, Stevenage, SG1 4HW

FOR SALE: Replay Sound Sampler, £25. Computer Animation Primer, £10. Revised Mapping The Atari, £10. Call Dave on 0799 41478

More overleaf

CONTACT

EXTRA

PENPALS ETC.

UPGRADED 520ST OWNER: Searching for ST contacts. Wishing to swap hints, demo's etc. Write to Alan Acton, 44 Gwelfor Estate, Cemaes Bay, Anglesey, LL67 0NL

PENPALS: I own an 800XL, 1050 disk drive with Hyper Drive, 1029 Printer and 1010 data recorder. I wish to contact other users to swap programming tips, game hints and tips, any age. All letters will be replied to promptly. Tel. (0942) 728979 or write to Mr. G. Hindley, 6, Rushmoor Ave., Ashton-in-Makerfield, Nr. Wigan, Gtr. Manchester WN4 8XH

XL PEN PALS: I would like to hear from users around the world. I have an Atari 800XL, data recorder, 1010 and over one hundred games. Write or phone. William Matthews, 62 Bullinslaw Drive, Eastfield, Rutherglen, Glasgow, G73 3NF. Tel. 041-641-6254

AMERICAN PEN-PALS: Must be absolutely mad on Atari 8-bit! Write to Robert Stuart, 22 Lewis Wynd, Broomlands, Irvine, Strathclyde, KA11 1HL Scotland

8-BIT PENPALS: I own a 65XE and would like to swap tips, games, etc., with other XE owners (10 to 12 years old preferably). Contact Steven Gregg, 62 Poplar Street, Grangemouth, Central Region, Scotland FK3 8NE

GLOSSOP/HADFIELD: Somebody else must have an ST in this area. If you want to share a common interest, phone Stewart on (04574) 4157

ST USERS: I would like contacts from all over the country and abroad to swap hints, tips and ideas. Guaranteed reply. Write to Kurt Frary, 278 Aylsham Road, Norwich, Norfolk. NR3 2RG

8-BIT PENPALS: I would like to hear from 8-bit users. I have an 800XL, 1010 and lots of software. Write to: John Blair, 16 Lockend Road, Casterhouse, Glasgow

ST USERS: New ST user seeks pen pals to swap ideas, info, etc. Write to Peter Jarvis, 194 Wyggeston Street, Burton-on-Trent, Staffs DE13 0SB. Phone 0283-36570

ST USERS: I would like contacts from anywhere. All letters answered. Simon Roebuck, Grove House, South Parade, Cleckheaton BD19 3AF

PENPALS: I am 21 and have owned an Atari for about 4 years. I would like to meet new people and swap info, hints, and tips on programming and games. All letters answered as soon as possible. Overseas people preferred but will write to any other Atari users. J.M.Donald, 18 Newbyres Ave, Gorebridge , Midlothian, Scotland

ST PENPALS: I would like to hear from and make friends with other ST users anywhere in the World! Please write to David Morgan, 2 Wern Ddu Road, Ammanford, Dyfed, S.Wales. SA18 2NE, or phone (0269) 3266

XL USER: My name is Dave and I have an 800XL, 1050 disk drive, XC12 tape. I am interested in adventures, shoots and thinking games. All letters will be answered. Write to 356 Sissons Road, Middleton, Leeds LS10 4JG

ANYONE OUT THERE?!!: I would like to contact any Atari 8-bit users in any area and abroad to swap hints and tips. Please write to Lee, 40 Hartness Road, Barton Green, Clifton, Nottingham, England

XL/XE OWNERS: Loadsa hints and tips etc., available for your computer. Just send an SAE to Mark B. Nobbs, Newholme, Aston Road, Chipping Campden, Glos. GL55 6HR

8-BIT USERS: I want to meet or correspond with XL/XE owners anywhere in Hampshire or East Dorset. Please telephone Richard on Southampton (0703) 865323 for an immediate reply

AMATEUR RADIO: Does anyone have a program for amateur radio which can put a log book on disk? Phone Julian on 0602 845232

BOGNOR REGIS ATARI CLUB: For anybody under 16 years of age. For further details contact M. Sinden on 0243 820598 after 6 pm

FRENCH PENPAL WANTED: Is there anyone in France who would like an English penpal? I speak good French and am willing to help anybody learn English. I have an 800XL, 1050 disk drive and a 1010 recorder. Please write to Daryl Pickthall at Lostock Brow Farm, Ulnes Walton Lane, Ulnes Walton, Leyland, Lancs or phone me on ENGLAND (19-44), Croston (0772) 600232 (don't forget to miss the 0 off the code)

LANCASHIRE USER GROUP: Is there anyone in Lancs with an 8-bit Atari who would like to set up a user group in the Leyland/ Croston/ Preston area? If so then please contact Daryl Pickthall at Lostock Brow Farm, Ulnes Walton Lane, Ulnes Walton, Leyland, Lancs or phone Croston (0772) 600232

HELP: Can anyone tell me how to load Electric Starfish (Calisto) on an 800XL? Loading with START and OPTION, START, CLOAD or RUN "C:" doesn't seem to work - any advice? Brian Smith, 45, Regency Square, Brighton, BN1 2FJ. Tel. 0273 25175

ST PENPALS: Wanted worldwide, near or far, to exchange ideas, programming tips etc. I have a large collection of PD software. Please write in English, French or German. ALL letters will be answered. Carl Ratcliffe, 47, Kedleston Road, Leeds, West Yorkshire, LS8 2BU, United Kingdom

Did you know? One US User Group placed a notice in CONTACT for penpals and was so inundated with replies that they had to find more penpals at their end to cope! The whole world loves Atari!

CONTACT is FREE of charge and may be used by any genuine Atari enthusiast for contacting other owners. Any notice may be included except those offering software only for sale or exchange or those offering items for sale commercially. The Editor reserves the right to omit any notice received at his discresion.
Send your CONTACT notice to CONTACT, PAGE 6, P.O. Box 54, Stafford, ST16 1DR. Please write your notice on a separate sheet of paper, not as part of a letter.

STRUCTU PROGRA

(or how to lay out your progra

Structured programming? What is it? Why use it?
There are several reasons for using structured programming and they all apply no matter what programming language you are using, whether it is BASIC, TURBO BASIC, MACHINE CODE, or anything else. The first, and most important in BASIC, is that it will speed up your programs. It also makes debugging and writing your programs a lot easier - you will see the advantages as we go along.
The basis of structured programming is the use of sub-routines, or in a structured language like Turbo Basic, procedures. The first thing to do is to divide your program into three areas

1. Main program loop
2. Data
3. The subroutines

We designate these areas by line numbers, and Figure 1 shows the layout I use in all my programs. I have found that this layout gives me enough room to write any program, including nineteen sub-routines of up to ninety nine lines each. The line numbers are not mandatory and you may decide to use different line numbers. The important thing is to keep the order as I have shown. This is where the speed factor comes in.
Lets have a quick look at how the Atari finds a sub-routine. When the program comes across a GOSUB statement the operating system starts from the first line number of your program and reads through until it comes to the one it wants. So any subroutine that is nearer to the beginning of the program will be accessed quicker than sub-routines further on. When the program reaches a RETURN it takes the address of where it has to go straight off the top of the stack, and so jumps straight there. This means that the main program can be anywhere and it will not affect the speed of the RETURN. Lets look now at how we would start to construct a program, I will demonstrate in Basic and Turbo Basic but you should be able to convert the ideas to whichever language you wish to use. Figures 2 and 3 give the details.

```
Line 10 GOTO 2000
Line 100 START OF FIRST SUB-ROUTINE
Line 200 START OF SECOND
SUB-ROUTINE
Line 300 .... ETC.
Line 2000 START OF MAIN PROGRAM
Line 3000 START OF DATA
```

Figure 1

TURED
RAMMING

programs without really trying)

by Roy Goring

USING REMs

You can see now how to lay out the program. You will notice that all REM statements are on lines that end in 99, so they can easily be deleted when the program is finished without the danger of deleting a line referred to in a GOTO or GOSUB. Line 2900 contains an endless loop and you will find this very useful as you build the program so you can view the screen. Without this the program will END when it completes the final sub-routine. When you start constructing the program all you have to do is write each sub-routine in turn and then run it to see if that routine works. This will be very easy to debug because you know the fault will lie in the final sub-routine. Try to avoid jumping to a sub-routine directly from another one without going through the main program.

The GOTO towards the end of the main program is put in after you have the program working. This jumps back to the start again after the main routine ends. You will notice that it does not jump back over the two setup lines 2000 and 2010. If you need to you can go back over 2010 but because the DIMs are in line 2000 you will cause an error if you jump back over this one.

You don't have to keep the sub-routines in order, so the ones that have to be accessed because of speed problems can be put nearer to the beginning. This is where pre-planning is useful when writing programs, you will already know what sub-routines you require so you can shuffle the order around before you start writing.

If you need a long initialisation, put it in the sub-routine that follows the instructions so that these can be read whilst the initialisation is going on.

You notice that the main program contains nothing but GOSUBs or GOTOs, try to keep it this way. Occasionally you will have to put some computations in to this area such as

```
2030 IF A=3 THEN GOSUB 300
2040 GOSUB 200
```

but this should only be used when it can't be done another way.

When writing a menu driven program structured programming is ideal, the main program is set out as follows.

```
2020 GOSUB 100 (displays the menu on
the screen and GETs KEY)
2030 ON KEY GOSUB 200,300,400,500,etc.
2040 GOTO 2020
```

```
10 GOTO 2000
99 REM ***** INSTRUCTIONS *****
100 start of instructions
190 RETURN
199 REM **** SCREEN *****
200 sub-routine to draw screen
290 RETURN
299 REM ***** ETC *****
300 .... etc.
390 RETURN
1999 REM ***** MAIN PROG *****
2000 DIM statements and variable set up
2010 continued
2020 GOSUB 100
2030 GOSUB 200
2040 GOSUB ETC.
2100 GOTO 2020 (put in after program
works)
2900 GOTO 2900
2999 REM ***** DATA *****
3000 DATA... etc.
```

Figure 2 - ATARI BASIC

```
10 GO# MAIN_PROG
99 ------------------------------------
100 PROC INSTRUCTIONS
190 END PROC
199 ------------------------------------
200 PROC SCREEN
290 END PROC
299 ------------------------------------
300 PROC etc.
390 END PROC
1999 ------------------------------------
2000 # MAIN_PROG
2010 DIM statements and variable set up
2020 continued
2030 #LABEL1
2040 EXEC INSTRUCTIONS
2050 EXEC SCREEN
2060 EXEC etc.
2100 GO# LABEL1 (put in after program
works)
2900 DO:LOOP
2999 ------------------------------------
3000 DATA .... etc.
```

Figure 3 - TURBO BASIC

This means that each menu item is in a separate sub-routine of its own, which again makes debugging and adding of additional menu items very easy.

As you can see structured programming has a lot of advantages especially when writing long or complicated programs. It makes your life as a programmer a lot easier, and if you are writing programs for PAGE 6, the people who type in the listing will find it a lot easier to follow the workings of your program, which helps them to learn new programming techniques. So take up structured programming now and put some structure into your programs! •

TURBO BASIC

MAKE IT MOVE!

by Gordon Cameron

This demonstration shows the use of the Turbo-Basic command MOVE, and makes use of all the other main features, such as procedures, labels, WHILE .. WEND and REPEAT .. UNTIL loops, as well as many others.

Nine frames of an animation sequence consisting of two pulsating ovals, a bouncing ball, and some text are first created. Each frame consists of these same objects in a slightly different position. The drawing takes place on a Graphics 8 screen, but only 70 lines are used. These 70 lines are then stored sequentially in memory reserved by lowering the top of available memory to 18000. The screens are drawn and saved invisibly, and then the animation starts with a short screen fade (PROCedure FADEIN). The 9 frames are then displayed sequentially on the screen, mimicking movement, however this is not all! After you press a key, the entire sequence is bounced around the screen in various directions, eventually coming to rest in the centre of the screen!

I will describe briefly how the animation effect is achieved. This is done by moving the 2800 bytes (70 lines by 40 cells horizontally, with each of these cells containing information on 8 points making a total of 320 pixels) from above the top of program-available memory, which was previously lowered, to the required SCREEN position. So, for example, the 9 frames are extracted from their place in memory, and placed at the beginning of the Graphics 8 screen and this is repeated until a key is pressed, with the frames being moved quickly to the same place over and over using the MOVE command. It is a simple matter to move these 2800 bytes of memory ANYWHERE on the screen, and this is exactly what happens when the entire sequence moves. Movement vertically is pixel-smooth, but horizontal movement is a little jerky, as the 2800 block can only be moved to any of the 40 horizontal CELLS so in fact it moves 8 pixels at a time (each pixel in GR.8 takes up only 1 bit).

You can easily change the frames for yourself, and by decreasing the SIZE of these frames you can increase the number that you have, making a longer sequence. I have reset the top of available memory to 18000 for my 800XL, as this suited my needs. If you have a 130XE, you may wish to alter where the data is stored, in which case you need only alter one or two variables.

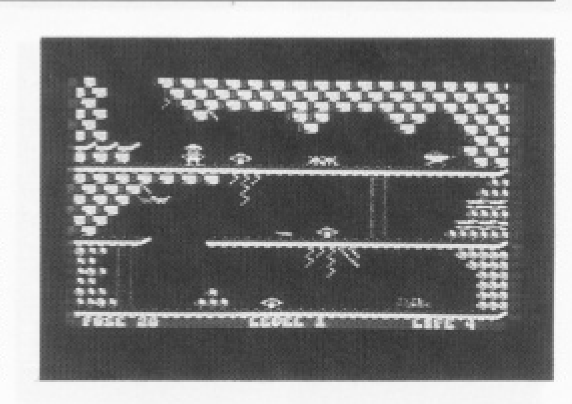
The program uses reasonably sensible variable and procedure names, and there are adequate REMS, so it should be easy enough to follow. If not, DON'T WORRY! You don't need to know HOW it works to see it running!

```
EX 1 REM ##################################
GO 2 REM #      TURBO BASIC DEMO         #
HO 3 REM #      by Gordon Cameron        #
DN 4 REM #          for PAGE 6           #
FB 5 REM ##################################
NL 6 REM
ND 100 REM ** Only need to run once .. *
BN 105 REM ** afterwards, only need to *
MA 110 REM ** type 'GO# RERUN' to re   *
SV 115 REM ** run, even after Reset    *
OS 120 ------------------------------
CI 125 GO# START
OU 130 ------------------------------
ZY 135 PROC MAIN
FP 140   REM Show the frames in correct
PF 145   REM order, and position.
QG 150   FLAG=(GAP=0)
MJ 155   REPEAT
FL 160     COUNTER=0
NL 165     REPEAT
HR 170       WHEREFROM=REPLACE+COUNTER*LE
   NGTH
RY 175       MOVE WHEREFROM,SCREEN+INC,LE
   NGTH
KN 180       COUNTER=COUNTER+1:INC=INC+GA
   P
JV 185     UNTIL COUNTER=8
QM 190   UNTIL (INC=HALT) OR (FLAG AND IN
   KEY$<>"")
WQ 195 ENDPROC
OP 200 ------------------------------
ZX 205 PROC INITIALISE
WS 210   DIM MESSAGE$(8)
SX 215   MESSAGE$="PAGE 6  "
HF 220   LENGTH=2800
TB 225   REM REPLACE sets the new top of
NY 230   REM memory for programs.It
PB 235   REM leaves a fair bit of space
TC 240   REM in which to store the frames
   .
CY 245   REPLACE=18000
LP 250   HIREP=INT(REPLACE/256)
PP 255   LOREP=REPLACE-HIREP*256
BQ 260   POKE 741,LOREP:POKE 742,HIREP
EJ 265   SCREEN=PEEK(88)+256*PEEK(89)
CN 270   ------------------------------
AZ 275   COUNTER=0:TX=130:TY=16:Z2=20
MB 280   REPEAT
LO 285     GRAPHICS 8:COLOR 1:SETCOLOR 1,
   0,0:SETCOLOR 2,0,0:SETCOLOR 4,0,0
XM 290     X=60:Y=35:Z=0
WF 295     REM Draw the 2 main globes
MM 300     REPEAT
PM 305       CIRCLE X,Y,COUNTER+Z,30
FQ 310       CIRCLE X+200,Y,COUNTER+Z,30
EW 315       Z=Z+8
EK 320     UNTIL Z=48
MK 325     REM Display the text
CC 330     TEXT TX,TY,"PAGE 6"
YN 335     TEXT TX+8*COUNTER,TY,MESSAGE$(
   COUNTER+1,COUNTER+1)
RH 340     REM Extra bits and pieces
FE 345     PLOT TX,TY+3:DRAWTO TX-10,TY+3
PU 350     DRAWTO TX-10,45
HT 355     DRAWTO X+100+Z2,45
OG 360     CIRCLE X+200,Y,48,30
YG 365     CIRCLE X,Y,48,30
JK 370     REM The bouncing ball
XN 375     CIRCLE X+100,45,Z2
XG 380     CIRCLE X+100,45,Z2,Z2/2
AF 385     CIRCLE X+100,45,Z2,Z2/4
NM 390     CIRCLE X+100,45,Z2,Z2/1.3
NW 395     REM The 'Stars'
VM 400     FOR LOOP=1 TO 50
FG 405       RX=RND(1)*316+1:RY=RND(1)*45
   +12
QP 410       PLOT RX,RY
RU 415     NEXT LOOP
TB 420     REM Move to memory
QB 425     WHERETO=REPLACE+COUNTER*LENGTH
YS 430     SCREEN=PEEK(88)+256*PEEK(89)
PA 435     MOVE SCREEN,WHERETO,LENGTH
XB 440     REM Increment frame
MU 445     COUNTER=COUNTER+1
VD 450     IF COUNTER>5 THEN TY=TY-1:Z2=Z
   2+1:GO# MARK
NS 455     TY=TY+1:Z2=Z2-1
JA 460     # MARK
LO 465   UNTIL COUNTER=8
HA 470 ENDPROC
PU 475 ------------------------------
HR 480 PROC FADEIN
QX 485   FOR LOOP=2 TO 14 STEP 2
OE 490     SETCOLOR 2,12,LOOP
OD 495     SETCOLOR 4,12,LOOP
VT 500     PAUSE 2
AD 505   NEXT LOOP
NU 510   FOR LOOP=12 TO 0 STEP -2
OE 515     SETCOLOR 2,12,LOOP
PB 520     SETCOLOR 4,12,LOOP
HM 525     PAUSE 2
ZU 530   NEXT LOOP
TT 535   PAUSE 10
FY 540   MOVE REPLACE,SCREEN,LENGTH
QQ 545   FOR LOOP=2 TO 14 STEP 2
NF 550     SETCOLOR 1,12,LOOP
WS 555     PAUSE 2
AA 560   NEXT LOOP
HO 565 ENDPROC
PG 570 ------------------------------
WS 575 PROC ANIMATE
SC 580   GRAPHICS 8:COLOR 1:SETCOLOR 2,0,
   0:SETCOLOR 4,0,0:SETCOLOR 1,0,0
EQ 585   SCREEN=PEEK(88)+256*PEEK(89)
DO 590   POKE 752,1:COUNTER=0
MA 595   EXEC FADEIN
UJ 600   PRINT "    Any Key to start move
   ment.."
OU 605   GAP=0:INC=0:HALT=1:EXEC MAIN
EP 610   PRINT "K          Motion commencin
   g."
XM 615   GAP=40:HALT=3200:INC=0:EXEC MAIN
AF 620   PRINT "K"
PJ 625   GAP=-41:HALT=2544:EXEC MAIN
WL 630   GAP=1:HALT=2560:EXEC MAIN
KP 635   GAP=-40:HALT=0:EXEC MAIN
SS 640   GAP=1:HALT=32:EXEC MAIN
LC 645   GAP=41:HALT=608:EXEC MAIN
YC 650   GAP=-1:HALT=640:EXEC MAIN
FQ 655   A=0
KX 660   WHILE A<10
IV 665     GAP=40:HALT=1920:EXEC MAIN
CA 670     GAP=-40:HALT=1600:EXEC MAIN
LE 675     A=A+1
YF 680   WEND
KZ 685   GAP=-40:HALT=0:EXEC MAIN
WQ 690   GAP=41:HALT=2952:EXEC MAIN
TN 695   GAP=-39:HALT=1392:EXEC MAIN
XF 700   GAP=1:HALT=1472:EXEC MAIN
MN 705   GAP=-1:HALT=1440:EXEC MAIN
CY 710   PRINT "              All Done  !"
VI 715   PRINT "           Any Key Restarts
   .."
GG 720   GAP=0:HALT=1:EXEC MAIN
WI 725 ENDPROC
PA 730 ------------------------------
MZ 735 # START
OY 740 REM **************************
TH 745 REM **     MAIN PROGRAM      **
RA 750 REM **************************
XB 755 EXEC INITIALISE
MG 760 # RERUN
WQ 765 DO
SQ 770   EXEC ANIMATE
SD 775 LOOP
```

GOING UNDERGROUND

Atlantis Software have been churning out budget titles at an incredible rate in recent months with scant regard to the Atari's capabilities or the sanity of its users. Now at last they have produced a game capable of holding its own amongst the intense competition from other companies. POTHOLE PETE is a multi-level platform game - nothing exciting about that - but programmed to a much higher standard of presentation than former Atlantis releases.

Such a game wouldn't be complete without an unbelievable plot to digest, and this one features, not surprisingly, Pothole Pete who to me looks remarkably like the immortal Bounty Bob on his way to an audition for a 'Pampers' commercial! Somehow he's managed to become trapped two miles below ground in an abandoned



mine working and is naturally quite anxious to escape. Especially so since the mine is home to hundreds of deadly vampire bats and other creepy crawlies along with poisonous plants and mushrooms all designed to make his chances of survival pretty remote.

Your task is to guide Pete through the perilous caverns in search of freedom. Each screen introduces a new distraction to prevent Pete from reaching the discarded stick of dynamite that offers his only hope of escape. Once located, the dynamite must be quickly taken to a rockfall and dropped before it detonates, or else it'll blow up Pete instead of blasting a safe passage through to the next level. Sounds like a pretty average sort of game, perhaps a little boring, but it's constructed in such a way so as to be extremely challenging yet at the same allowing you to progress sufficiently to always want 'just one more go' when Pete finally meets his grief. He only has five precious lives to begin with but an additional one is awarded upon the completion of each screen. Practice certainly makes perfect.

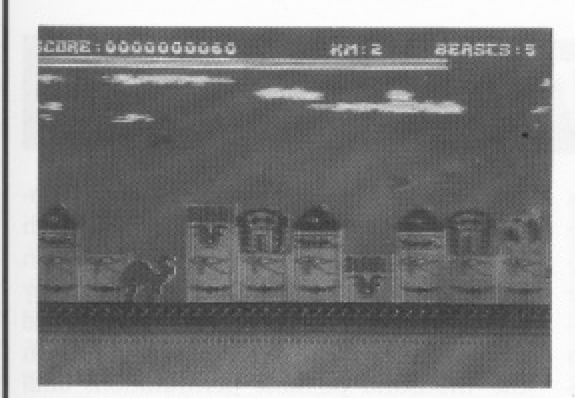
There isn't any mention of the number of different levels (I do wish Atlantis would employ someone to write their instructions!) but from what I've observed of the first five, they are very well designed with good use of colour and lots of interesting scenery giving the overall impression that a lot more care and effort has been taken on the finishing touches than in previous Atlantis games. They've even redefined the character set! Sound is unfortunately of the familiar low standard associated with this type of release - a great pity as we all know that the Atari is capable of much better things.

Altogether, POTHOLE PETE is a very enjoyable platform game that is certainly challenging but sufficiently user-friendly to maintain its appeal. If you like platform games, it could well be one of the best £1.99's you'll ever spend! Well done Atlantis!

Paul Rixon

Title: POTHOLE PETE
Publisher: Atlantis
Price: £1.99 cassette only
Players: 1
Control: Joystick

MIND THAT CAMEL



Is it a bird? Is it a plane? No, it's a ninety foot high laser-spitting Mutant Camel and it's got the 'ump!!! Of course, this could only be a concept from the unique and mysterious imagination of 'light-synth' pioneer Jeff Minter, whose former program Attack of the Mutant Camels (AOTMC) became justly recognised as a tour-de-force of Atari programming. Sadly, the follow-up - Revenge of the Mutant Camels (ROTMC) - was not released in Atari format but REVENGE II has now arrived from Mastertronic and it's billed as the sequel, although the inlay is somewhat misleading in that the game's author is in fact Icon Design's Steve Riding rather than the Llama man himself.

The story so far: Alien adversaries from the mighty and tyrannical Zzyax empire, abducted from the Earth a number of genetically engineered Camels and brainwashed them into attacking our human forces. The resulting episode was a historic battle known as the AOTMC but thankfully, justice prevailed. Angered by their defeat, the Camels rebelled against the Zzyax in an epic confrontation vividly recalled as the ROTMC. They subsequently returned to Earth but their whereabouts in the preceding six thousand years are unrecorded. Rumours suggest they may have something to do with our 'ultimate defence system' - an inherited asset that was not to be revealed, let alone used, in all but the most desperate of circumstances. But the Zzyax have now re-emerged and methinks we shall have no choice......

REVENGE II sits you at the reins of one of these infamous mutant beasts and you'll need all the power of its neutronium shielding to survive the constant bombardment by Zzyax forces. What sort of missiles are you up against? Simply think of an object - the sillier the better - and it's odds on you'll find it in one of the hundred Alien waves! Postboxes, floppy disks, ring pulls - they're all here! And cleverly animated too. Your initial weapon is unlimited laser fire but credits are awarded at the conclusion of each wave enabling you to buy additional goodies such as treble-strength shields and yo-yo bullets plus extra lives and energy. Oh!, and you can fly too!!

Graphics are generally good and utilise a fair proportion of the Atari's capabilities, although not to the same profuse extent as Minter's AOTMC. You won't find any stunning 'Rainbow' graphics but instead there's some neat horizontal scrolling in two directions at five different speeds, not to mention the nicely animated Camel and interesting background scenery. Not just futuristic landscapes but also rows of cigarette packets endorsed with RIP slogans!

REVENGE II has all the hallmarks of an S.A. Riding conversion - disappointing in the sound department but well above average graphically and oozing with playability. A worthy, but above all, really weird addition to the budget range.

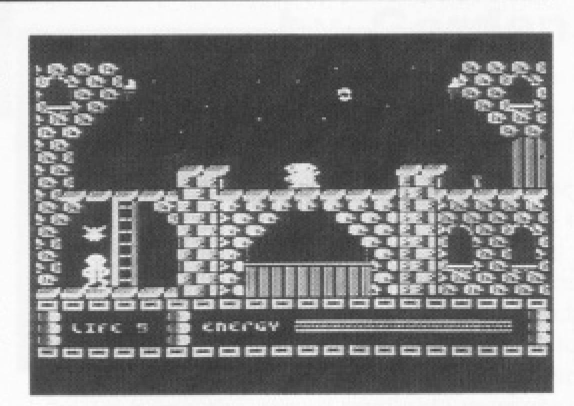
Paul Rixon

Title: REVENGE II
Publisher: Mastertronic
Price: £2.99 on cassette
Players: 1
Control: Joystick

BUMP IN THE NIGHT

Evil ghosts have imprisoned the beautiful Princess Clare in the dank dungeons of Spooky Castle, and King Michael has promised Clare's hand in marriage to anyone brave (or stupid) enough to save her. If this sounds like the plot of a platform game to you then you're not far wrong! SPOOKY CASTLE is the latest budget offering from Atlantis Software, and is indeed a multi-screen platform game of the traditional variety.

Gormless Gary (a peasant of limited intelligence) has volunteered to undertake a rescue attempt, so it's your job to guide him through the seventeen rooms of Spooky Castle. The rooms are separated by locked doors, although the keys are relatively simple to locate. The real hindrance is provided by energy-sapping bats and the persistent ghosts which invariably



appear from nowhere and fly frustratingly across the display just when you hoped they wouldn't! In typical form, Gary has forgotten to take any weapons on his mission so he must rely exclusively on his not inconsiderable jumping abilities to avoid death by contact with the ghosts and other dangerous obstacles. Fortunately, energy potions and additional lives can be collected along the way, by moving over an appropriate symbol. The symbols reappear each time the same room is re-entered, so it's possible to accumulate an enormous number of lives at certain points in the game, if you should need to.

Graphics are quite well done, the joystick response is good, but the sound is pretty abysmal. However, the major cause for concern doesn't become evident until you actually commence play.

As far as I've been able to perceive, it is impossible to progress any further than level thirteen!! I've reached this stage with numerous lives in hand, and yet the only two doors leading to level fourteen are blocked by impassable pillars! I've doubled back several times and searched for hidden exits, but all to no avail. It seems peculiar that such an obvious bug should slip through unnoticed, and I'd be interested to hear from anyone who could shed any light on this problem. Also, on one occasion the game suddenly terminated with the message 'Error 141' (cursor out of range?), followed by a series of numbers and the prompt 'Run address:?'. Machine code programmers will probably have an explanation for this, but once again it illustrates a lack of thorough checking by Atlantis.

SPOOKY CASTLE would have been a reasonable platform game if it weren't for the bugs I've mentioned. It certainly had me hooked in the early stages, but if these only lead to a dead-end situation then I'm afraid it's definitely a game to avoid. Best check with Atlantis before parting with any cash.

Paul Rixon

Title: SPOOKY CASTLE
Publisher: Atlantis Software
Price: £1.99 on cassette
Players: 1
Control: Joystick

A LIFE SENTENCE!

Oh dear! Is this one really intended for the Atari? Alas, yes, COPS N' ROBBERS is indeed a new addition to Atlantis Software's range, although for a minute there I was almost convinced that someone had mischievously connected up a Spectrum to my monitor!!

Abysmal is a fairly accurate description of the graphics in the game. The playfield comprises of a maze of several blocky walls viewed from overhead, but the adversaries are mono-coloured PMG's defined in a side-on fashion. The screens - of which there are several - are presumably based on Antic mode 4, but the author 'SIZ' has made little attempt to disguise their text-based origins. You can count the blocks - forty across, twenty four down! A joystick controls your character, who is more cleverly designed, but the PMG collision detection can only be described as irritating!

As for the plot, well, to be honest it's really of the same standard as the graphics! Light Fingers Lonegan has decided to raid the headquarters of the Acme Diamond Company and Atlantis have decided that you are going to assist him. In order to accomplish this, your joystick trigger becomes that of Lonegan's .45 Magnum and you are invited to use it at every available opportunity in order to get past Police Officers who are naturally trying to prevent you from collecting the gems. Does this sound like an activity that ought to be encouraged? Should a criminal assassin be portrayed in such a positive manner? I recall the recent controversy surrounding 'Little Devil'. Is rescuing a Princess worse than gunning down the occupants of a legitimate business premises? Of couse not! Surely this is a vastly superior contender for the sin-bin?

There's more... Should Lonegan get captured - and I hope he does - he can use a subsequent life to blast his way into the jail and free his previous 'life'. Additional gems are located in a nearby mine, coincidentally the regular haunt of the local ghost community. Contact with an apparition spells a trip via Ambulance to the morgue - all pleasant stuff! Apparently, the ultimate objective is to obtain the contents of a safe, the combination for which is zealously guarded in a locked room on an upper floor of the building. You may either collect the key from a protected alcove in the mine or you can toil through the thousand possible permutations until you discover the appropriate one (I found the latter method quickest!). A getaway car awaits your successful escape with the loot.

Frequent interludes during gameplay are a particularly annoying 'feature' of the game. Also, the instructions supplied would comfortably win an award for being the least informative!

All in all, the game is a real disaster area! Whoever SIZ is, they ought to stick to programming whatever they know best - and that clearly isn't the Atari. Bad graphics, bad sonics, bad taste. COPS N' ROBBERS has them all!!

Paul Rixon

Title: COPS 'N ROBBERS
Publisher: Atlantis Software
Price: £1.99 on cassette
Players: 1
Control: Joystick

DOWN THE MIDDLE



Golfing enthusiasts have, up to now, been poorly supported by Atari 8-bit software. Apart from some really dreadful attempts in Basic, I can think of only one game to have successfully simulated the sport - Leaderboard. Atlantis Software's PRO GOLF is not directly comparable though, as it's biased heavily towards the strategic element rather than the visual.

Up to four players may compete on a choice of either Sunningdale (England) or Pebble Beach (USA) courses. These are loaded as individual programs on either side of the cassette. Further options include championship, single round or practice modes with an alternative of medal or championship tees. It's important to make the correct selections at this stage as the game does not offer any kind of abort facility - an unfortunate and potentially frustrating oversight. Before the game commences, you can also adjust 'wind' and 'ground' parameters as required or instruct the computer to generate them randomly.

A birds-eye representation of the fairway and surrounding landscape is now displayed, with different shading indicating rough ground, bunkers, trees and so on. A minute flashing dot marks the position of the ball and a black circle shows the hole you are aiming for. It's a primitive and unattractive screen-view but it does serve the intended purpose of influencing your choice of tactics. Hole number, Par and the number of yards from tee to hole are stated to aid your calculations, and you should also bear in mind the current wind and ground conditions. Club type, strength of shot and direction are chosen sequentially by pressing 'O' and 'P' on the keyboard followed by Return to confirm the selection. To actually make the shot, the space bar is pressed once to begin your swing and again to hit the ball at precisely the correct moment. A small animated golfer in a separate 'window' helps you to achieve the appropriate timing.

Should you make it onto the green the display changes to a close-up birds-eye view of the hole and you are prompted to select power and direction. As before, the space bar is used to make the shot and a line representing a putter replaces the animated golfer to assist you. After each completed hole you are shown your personal scorecard followed by the leaderboard which includes famous names such as Sandy Lyle and Seve Ballesteros. Unless you want to save the game to tape for resumption at a later date, the cycle now repeats.

Apart from the graphics, the only major gripe I have concerns the keyboard-only input. It seemed quite a chore even in one player mode and with four participants fighting for a seat at the keyboard I should imagine the game becomes almost unplayable! If you aren't deterred by a lack of picturesque graphics PRO GOLF might be worth checking out.

Paul Rixon

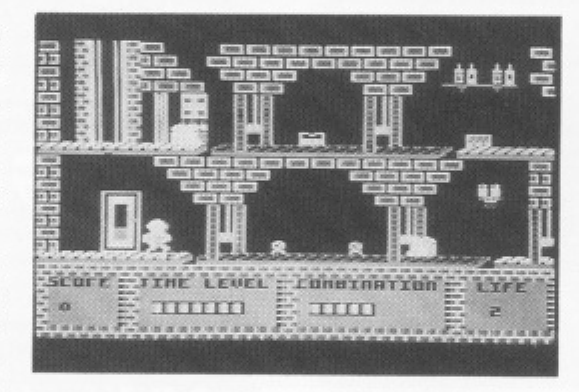
Title: PRO GOLF
Publisher: Atlantis Software
Price: £2.99 on cassette
Players: 1/4
Control: Keyboard only

LOTS OF LOVELY LOLLY

Here's yet another budget platform game from Atlantis Software that is similar in many respects to Pothole Pete, programmed by the same authors and also reviewed in this issue. Many of the comments made in that review are therefore equally applicable here.

DAYLIGHT ROBBERY has five levels set over ten different screens and a scenario based around a high security banknote printers, so secure in fact that no human guards are deemed necessary. Access to each level is restricted by a security pass system and a strict time limit is imposed on each floor. The building is also extensively booby trapped and patrolled by robot guards. The ultimate security system it seems, or is it? All you've got to do is collect the passes, negotiate the traps, avoid the robots, watch out for the printing presses, find the safe combination and then collect the reward! Things are never quite as easy as they seem at first, of course, and the resulting task is quite some challenge.

Any contact with robots, traps or presses will instantly prompt your demise, and you only have five lives available - no bonuses are awarded. When you lose a



life, your resurrected character is placed back at the very beginning of the level you are currently on. This can be quite frustrating as the levels stretch over two (effectively four) screen lengths, meaning that a lot of hard work can be ruined by the slightest slip of the joystick. A reliable trigger button is an absolute necessity as this controls the jumping abilities of your character. Every screen requires split second timing in order to avert disaster.

Graphics are even better than those in Pothole Pete - great stuff! - with plenty of animation and some good detail in the background scenery. I dislike the 'amateurish' Gr.2 text interludes which appear in between each life, although they do help to overcome the unfortunate ommission of a pause facility. Too bad if the 'phone rings or someone's at the door just as you're about to crack the final level! The game is certainly a challenge, but the fact that I managed to complete it in just a few sessions suggests that its lasting appeal may be pretty weak. I won't disclose the ending incidentally, all I can say is don't bother calling the neighbours around to see it!

I was on the verge of commending Atlantis for an essentially flawless effort when suddenly my character became stuck in a neverending loop of getting killed. Re-boot was the only remedy. This again brings into question the thoroughness with which Atlantis assess their prospective releases. Gripes aside, if you're the sort who enjoys a pixel-scraping challenge and aren't put off by a few imperfections such as those described then DAYLIGHT ROBBERY is well worth investigating.

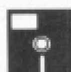
Paul Rixon

Title: DAYLIGHT ROBBERY
Publisher: Atlantis Software
Price: £1.99 on cassette
Players: 1
Control: Joystick

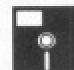
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PAGE 6 back issues represent an excellent way of increasing the enjoyment of your Atari with articles to enlighten you, programs to type in and reviews of software to guide you. Almost all of the content of past issues will be as fresh and relevant today as when it appeared - increase your enjoyment now, before it's too late! Disks are available for all issues, containing all the 8-bit programs from each issue ready to run, and they often include bonuses not found in the magazine.

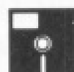
ISSUE 20 - GRAPHICS SPECIAL. A super special issue with a graphics theme. Draw some masterpieces with GRAPHICS WORKSHOP and explore your graphics potential with Colour Palette, Picloada, Colour Attributes and CIO Slideshow. An in-depth review of Printshop and Graphics Art Department, the final part of Display Lists and the Adventure column. 11 pages devoted to the ST plus a colour feature ATARI ART and ST GALLERY. And there's more! BLOCKBREAKER is one of the best games to have been published in any magazine. Don't miss it!


DISK AVAILABLE - incudes BONUS PICTURES for Graphics Workshop

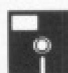
ISSUE 21 - A packed issue with games, TRAIN CRAZY, REVENGER and FORKLIFT. Utilities SCALEMASTER, QUICK DISASSEMBLER and Measuring Temperature. Programming hints with Doing The Impossible, Error 8 Solved and THE GUIDE TO ERROR CODES. Reviews of Flight Simulator II, Hitchhiker's Guide to the Galaxy, and the latest Adventures. For the ST a DEGAS to NEO converter, Lattice C reviewed and reviews of a whole host of software.


DISK AVAILABLE. All programs ready to go.

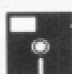
ISSUE 22 - More serious users will enjoy SMARTSHEET, a Visicalc like type-in spreadsheet, plus our review of Paperclip whilst gamesters will puzzle over TRICKY CUBES and try to survive HIDDEN DEPTHS. The Guide to Error Codes is concluded and there are articles on Fractals, Tape Problems and some less well known Adventures. Loads of reviews and some great new routines for Blockbreaker. ST users will find out how to program Sprites and can read reviews of Time Bandit, Pro-Fortran 77, VIP Professional and more.


DISK AVAILABLE - DOUBLE SIDED! Contains TWO versions of TRICKY CUBES and new versions of BLOCKBREAKER.

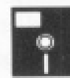
ISSUE 23 - Another superb machine language game WATER SKI SCHOOL will test your reflexes. WORDSEARCH will challenge those who like puzzles and other listings include SUPERCLOWN and the utilities XREF and VERIFY. A huge review of Ultima IV heads a comprehensive review section and Going Online Part 1 will let you know if telecommunications is for you. ST owners can discover how to get a bigger screen on their colour monitor and read reviews of Zoomracks, Sierra On-Line adventures and Pro-Pascal amongst others. Also, is it worth adding a 5/4" drive to your ST?


DISK AVAILABLE. Contains TWO BONUS PROGRAMS!

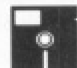
ISSUE 24 - The biggest issue so far published! Great ST section with info about ST disks and cartridges and loads of reviews. For 8-bit users there is MUNCHY MADNESS, the best game we have ever published plus a super cheque book utility AUTOCHECK. Plus all about checking your disk drive, another game called FLYING HIGH, more utilities, reviews of RAMBIT, Adventure games and lots more. Too much in this issue to list fully!


DISK AVAILABLE - Don't miss MUNCHY MADNESS, the best game we have published so far!

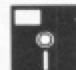
ISSUE 25 - Another biggie! A must for 1029 printer owners with 3 great utilities including a SCREEN DUMP. A super Japanese chess game called SHOGI, a type in REVISION C BASIC, a full feature on disks and more. For ST, type in OTHELLO, reviews of LEADER BOARD and MEAN 18, Hints and Tips and several other reviews and articles.


DISK AVAILABLE - ALL THOSE 1029 PROGRAMS READY TO GO!

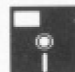
ISSUE 26 - SOLID MODELLING is one of the best non-game programs we have published. Be creative! Other programs include SOURCE WRITER for machine code programmers, FLEXIBLE FINGERS to help you type, NUTS and more. Reviews of TRIVIAL PURSUIT, DVC/65, SPEEDSCRIPT and much, much more. ST users can learn all about HARD DISKS, FAST BASIC, TYPESETTER ELITE, DEGAS ELITE and read reviews on a whole lot more software.


DISK AVAILABLE - DOUBLE SIDED! TWO full sides with BONUS SCREENS for SOLID MODELLING!

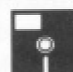
ISSUE 27 - Some cracking listings for the 8-bit. In GREAT BRITAIN LTD. you can be the Chancellor and help run the country. COMPUTER GAMMON is a great Atari version of backgammon and there's ANTS IN YOUR PANTS, DISK COMMAND and others. There is a feature on word processing and stacks of reviews. The ST section includes an in-depth review of ART DIRECTOR and a neat little program to put scrolling stars on your screen! Lots of reviews including HABAVIEW, K-SPREAD 2, K-WORD and many more.


DISK AVAILABLE - some L-O-N-G LISTINGS!

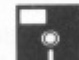
ISSUE 28 - Extend the incredible original Munchy Madness with the MUNCHY MADNESS SCREEN DESIGNER, play GREEDY CATERPILLARS with a friend, teach your children with MOST HEART MATHS or make up some crosswords with XWORD. A long feature on flight simulation programs, hints on ZORK and loads of reviews. For ST users, the first in a series of USING GEM from C plus FLIGHT SIMULATOR II reviews, new books from COMPUTE! and a whole stack of reviews.


DISK AVAILABLE - Also contains the winning title screen from our competition.

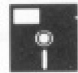
ISSUE 29 - One that serious 8-bit users have been waiting a long time for - a great full feature database - MJDBASE plus an amazing story maker, STORYBOOK, that allows you to create illustrated stories. Then there's a great game from ANTIC called CLIFFHANGER and an AUTORUN maker and more. Cheat on commercial games with ZAPPING THE RIGHT BYTE and read stacks of reviews. The ST section has a type-in program, SCREEN GRABBER, which allows you to 'snatch' pictures of commercial games to disk, plus the next part in our GEM FROM C series and reviews of Superbase Personal, K-COMM 2 plus lots of games including Barbarian. Another big issue.


DISK AVAILABLE. DOUBLE SIDED. With BONUS story for STORYBOOK and STORYBOOK reader.

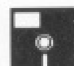
ISSUE 30 - A great follow up to Solid Modelling allows you to animate 3-D objects. Try 3-D ANIMATOR. How about a puzzle with LETTER CASTLE or an arcade style shoot-up from ANTIC called DESERT CHASE? Articles inlcude an in-depth look at GUNSLINGER, Genealogy With Your Atari and Firts Steps on saving screens. Loads of reviews including AUTODUEL and P:R: CONNECTION. The ST section includes the continuing GEM series, CYBERSTUDIO, ZOOMRACKS II and loads of games and serious reviews including GFA BASIC, K-Roget, Jupiter Probe and more.


DISK AVAILABLE. DOUBLE SIDED with BONUS MACHINE LANGUAGE ADVENTURE only available on this disk!

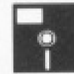
ISSUE 31 - Our massive survey on all the WARGAMES available for the 8-bit Atari heads this issue which also includes a great type-in synthesiser listing called ORIGINAL SYNTH. Other listings include FONT FACTORY, a nice character editor and a challenging game called BOWL TRAP. A feature on SSI, more Tutorial Subroutines, a long feature on THE NEVERENDING STORY, reviews of ROADWAR 2000 and THE DUNGEON plus many more are also in this issue. ST SECRETS, a new series on ST programming begins with a look at sound and the ST reviews section includes IMG SCAN, BASE TWO, TEMPUS and many more.


DISK AVAILABLE - All the extra files for ORIGINAL SYNTH set up ready to run plus all the other listings.

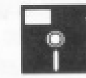
ISSUE 32 - A great card game for 8-bit users called, rather uninspiringly, WHIST plus a two player game of TENNIS and a GRAPH MAKER that works on the 1029 printer. A new series starts on EXPANDING YOUR ATARI and there is an excellent program/tutorial on BUBBLE SORTING. Reviews include THE PAWN, GUILD OF THIEVES, SPARTADOS/U.S. DOUBLER and many more. ST users can find out about programming graphics with ST SECRETS and can read all about the TURBO DIZER, PC DITTO plus reviews of Tanglewood, Defender of The Crown, Winter Olympiad, PROSPERO FORTRAN and more.

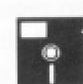

DISK AVAILABLE - DOUBLE SIDED with BONUS MACHINE CODE ARCADE GAME available only on this disk.

ISSUE 33 - Many readers have said this is our best issue yet with an extensive feature on choosing a printer for your Atari, plus HEAVY METAL, a superb type-in machine language arcade game. Other type-in listings include another game, CRYSTAL CRISIS and two utilities, COLOUR TUNER and SOFTKEY, the latter being a super keyboard 'macro', utility. ST owners can find out more about PROGRAMMING GEM with another article in the series and there are loads of reviews including MASTERPLAN, GUNSHIP and SPECTRUM 512. There's much more in this issue besides, including some great music for the 8-bit.


DISK AVAILABLE - including TWO BONUS GAMES that are not in the magazine and not available elsewhere!

ISSUE 34 - An Adventure special to delight all fans of Atari Adventuring. Exclusive and extensive interview with Level 9, two type-in 8 bit adventures, reviews of many games, bumper A-Z hints and tips for all kinds of adventures, a survey of almost every known Atari adventure and much more. Other items include Dave T's Disco, Flying by the Book, Tutorial Subroutines, the Shell Sort and the regulars. ST File includes a round up of ST adventures, a review of Dungeonmaster, hints on certain adventures and stacks of general games reviews. Primarily an issue for Adventure lovers but with many items of general interest.


DISK AVAILABLE - includes TWO BONUS ADVENTURES only to be found on this disk including a machine code special.

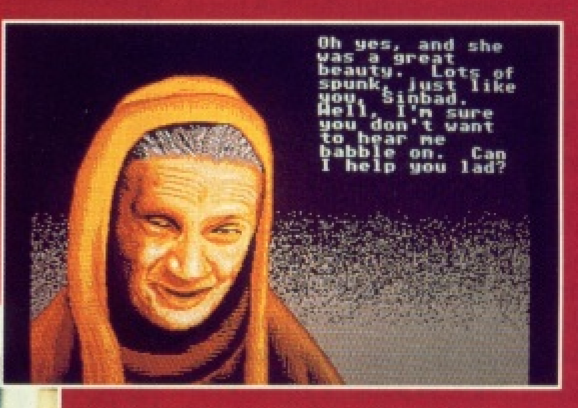

DISK WITH BONUS MACHINE CODE PROGRAM ALSO AVAILABLE FOR THIS ISSUE

BACK ISSUES are £1.20 each in the U.K., £1.95 for Europe or surface mail elsewhere and £2.75 for Air Mail outside Europe
ISSUE DISKS are for any 48k or 64k 8-bit Atari. Each disk is £2.95. Postage FREE in U.K. Overseas add £1 per order (any number of disks)
Send your order to PAGE 6, P.O. BOX 54, STAFFORD, ST16 1DR, ENGLAND. ACCESS and VISA accepted. Telephone 0785 213928

The ST FILE

Has YOUR ST got a VIRUS?

Turn to page 64 to find out what to do



SINBAD AND THE THRONE OF THE FALCON



The long awaited ELITE

THE MUNSTERS signed up by Again Again

MICKEY MOUSE from Gremlin



SDI from Mediagenic



ST SPECTACULARS

ST NEWS

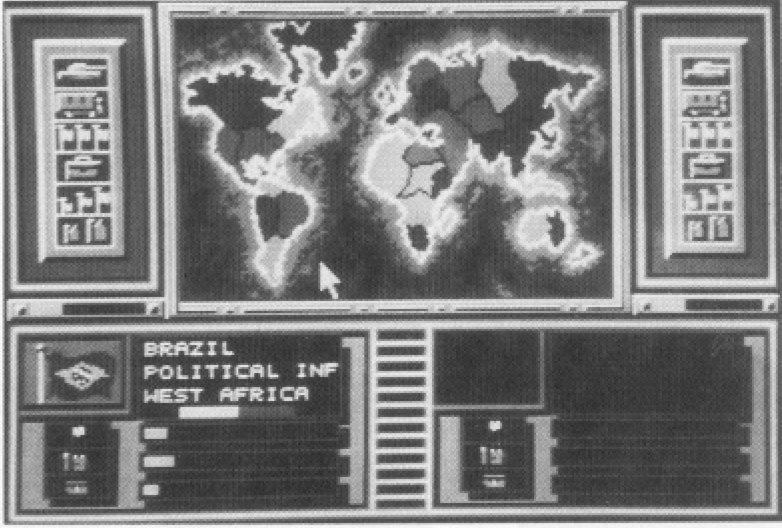
A whole flood of software to end the year with, some has come and gone, others still awaited - Sinbad and The Throne of the Falcon from Mirrorsoft at £24.99 has been around for a while with some spectacular graphics, ELITE out at last from Firebird priced £24.95 has over 2000 planetary systems for you to explore. Mediagenic promise some biggies with SDI featuring warfare on the battlefields of tomorrow at £19.99 and the year's arcade smash AFTERBURNER coming along at £24.99, add R-TYPE, INCREDIBLE SHRINKING SPHERE, TIME SCANNER and more and you are in for a hectic time! Mediagenic also have the nearest game so far to the arcades with SUPER HANG ON, a motorcycling game with excellent graphics at £19.99. Looking ahead with something new is a new label called Again Again who have signed up THE MUNSTERS, now at last you can see it, from Mid-November, in colour! Incentive have DRILLER a three-dimensional world with over 20,000 BILLION screens possible (what?), at £24.95 that's just only (just a mo', I've run out of fingers) a screen! Another 3-D game is WANDERER from Elite, a mix of strategy and arcade adventure and Elite become one of the few to branch away from the arcades with MIKE READS COMPUTER POP QUIZ featuring over 1,000 questions and help from your favourite pop stars. And there's more, much more - just a small selection from a two foot high pile of press releases and handouts since Issue 34! Get down to your local computer store and check the action.

ST WARS

The first couple of British ST wargames reviewed by Ron Stewart

As a wargamer of long standing I have been waiting for the flood of wargames to appear on the ST. Up until now my wait has been in vain.

The main producer of computer wargames is SSI and they have been studiously ignoring the ST, although their recent release Stellar Crusade, is an excellent strategy game. I'm also told that Kampfgruppe and their new American War of Independence game Sons of Liberty are on the horizon. Another game that should be released by the time you read this is Atari U.K.'s re-creation of the napoleonic battle of Borodino. Rumours say that this release will be as revolutionary in its way as Universal Military Simulator.



POWER STRUGGLE

Given this background I was quite pleased when I was sent two games from PSS. Both of these games have been released before on other computers and have been been ported to the ST. If we take a scale where one equals the boardgame of Risk and ten equals SSI's War in Russia, then Power Struggle comes in at two. The other release Annuls of Rome will merit a four. Neither of these simulations are full blown wargames, they are strategy games that involve politics and economics. Lets look at Power Struggle first.

POWER STRUGGLE

This game only has one screen on which a picture of the world is displayed along with the game controls. The game can be played either against the computer or with two people. Basically, it is a game where east fights west for control of the world - no holds barred. At the start of the game the world can be divided up, by countries, into a fairly standard east/west configuration. You also have the option to randomise the allocation of countries. For each country under your control you have a number of options - attack or supply another country, use political power, help in defending another country and finally build armies or factories. These options must be allocated within a certain time limit. The problem is getting the interrelationship right. For instance when one country attacks another country you must back up the first to ensure that it does not get invaded in turn. This is vital because if you are playing against the computer it is very swift to pounce on mistakes like these. The main problem with all of this is that you will never find out why things happen. You have a good idea of two countries strength and power but the mechanics of the takeover are not disclosed. At the end of the turn the computer works out all the changes in the blink of an eye. I would have preferred something slower, telling you why things were happening.

Generally, Power Struggle could be said to be the baby brother of Chris Crawford's Balance of Power. It is nowhere near as complicated but it can be played out in under and hour.

ANNALS OF ROME

A very different game. This is a game that will put you on a number of knife edges. The game itself has you balancing resources in a strategy of offence and defence. You must also balance the members of the Roman senate to negate rebellion and dictatorship. Finally during some aspects of the game you will be so frustrated at the events going on that a final push will have you heaving the computer through the nearest window!

Annals of Rome depicts the rise and fall of the Roman empire. It starts in the year 273 BC when the rule of the countries of Europe and Asia is in a state of flux. You are required to guide internal and external affairs to complete Roman domination. Your success in this is shown by your score. On the screen is a map of Europe and Asia divided into regions. Each region is shown in a different colour or pattern dependent on who is ruling over it. Inside each region is a number which shows how many troops are garrisoned there.

Lets go through the game step by step. You must first go through an economics phase. Here you must decide on how much you can tax your population for the next period. Periods, by the way, are variable, their length will depend on how much is going on in the game, generally though they are about four years. Setting too high a tax will affect your popularity which can lead to rebellion. Next come three phases where you can find out about the personalities in the senate. There are twenty-two senators. Each is rated as to his ability to command and his loyalty to the governing regime. Once the empire is expanding you must use these figures to attempt to maintain a stable, non-changing, government. Some commanders may try to rebel against the republic and this will affect your popularity index. If this is high the chances of rebellion are low. If it is low the chances are high.

You can pre-empt rebellion by paying the legionaries lots of money so that they remain loyal. You can also remove a plotter from office and replace him with someone more loyal. If a commander successfully rebels in Rome you will be faced with a dictator or emperor. This has a domino effect and destabilises things for a couple of turns to the detriment of your overall score.

The next phase is foreign wars. Here you attempt to expand the empire. This is also where most of the frustration creeps in. During this period you will have to sit back and watch all sorts of mayhem as the countries are carved up. On the map countries change rulers and dynasties emerge and fade. Because the turn of each country to fight is chosen randomly you may have a while to wait, especially in the emergent stages and there is not a single thing you can do about it. Reinforcements are just not available. Your empire can be decimated and you remain powerless to stop it. Finally you get the chance to fight back and regain old ground or take new.

As the ebb and flow continues you can find yourself loosing the new territories. This is where the computer gets switched off or slung out the window! If you have managed to sit through this the years now advance and another turn begins.

Apart from the frustration Annals of Rome is a finely tuned game that can have you alternately swearing or cheering.

POWER STRUGGLE - £9.99
ANNALS OF ROME - £24.99
PSS Wargamers Series

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A-MAGIC Video Digitiser

The **A-Magic Turbo-Dizer** was developed especially for the Atari ST. It is one of the fastest video-digitizers on the market, certainly within its price range. Simply plug the small black box into your ST's ROM port (or Mega ST), run the TurboDizer software and you're ready for action. From now on you can display everything on your SM 124/125 or colour monitor. All you need is a PAL video signal, which may be obtained from a video camera or VCR.

You can digitize using your ST in 2 - 32 grey levels and process the the image using the following programs: Degas (Elite), Neochrome, Colorstar, Monostar (+), STAD, Art-Director, D.R.A.W. ... Using two grey levels it is possible to digitize up to 25 pictures per second (realtime). What else can you do with the digitizer?

- Advertising - Illustrations - Time-Lapse Photography -
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in fact, *any* purpose which requires an image obtained, generated or displayed using an ST computer.

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Calling all Adventurers!

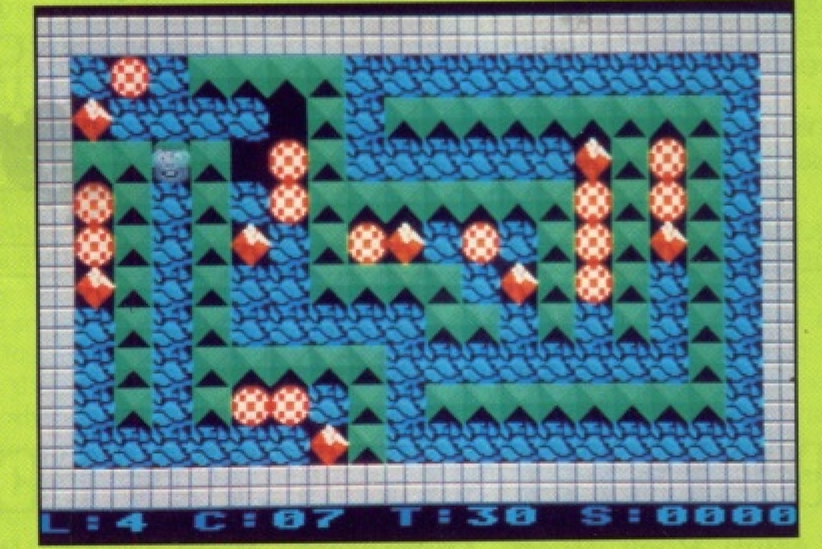
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MAD

From the author of Munchy Madness - one of the best Atari 8-bit listings ever published - comes the the ultimate type-in ST listing. Paul Lay and Harvey Kong Tin bring you the ST version of Munchy Madness



MAD is a single player, all machine code, arcade style game for any Atari ST in colour that can be typed in by any owner using ST BASIC. The listing is an Atari ST Basic listing which generates a machine code program file. Simply type the program in, make a backup copy for safety, place a formatted disk in drive A and run the program from ST BASIC. If any typing errors have been made, the program will report the line in error and then stop. Correct the error and then run the program again. When all the errors have been removed you'll end up with the program on disk as the file 'a:\mad.prg'. This program will be a stand alone machine code file that can be loaded in the normal way, by double clicking. ST BASIC is no longer required.

PLAYING THE GAME

The object of this game is to work your way around a series of strange underground caverns collecting jewels. When you've collected enough jewels in a cavern, an exit will appear which will let you progress onto the next cavern. Each cavern is made up of complex mazes and walls restricting your movements and they are also filled with nasty Amiga balls which will come crashing down on you if you are careless. To make things even worse, you are only allowed a certain time inside each cavern.

Start the game by pressing the joystick trigger and you will be at the first screen. Alternatively you can start at any of the first 4 screens with keys F1, F2, F3 and F4. Movement is controlled by a joystick in port 2, or via the CURSOR keys on the keyboard. You can pause the game with the SPACEBAR, followed by any key to resume. You can terminate a life with the ESC key, (to get out of those nasty situations).

At the bottom of the screen you will see a status line

L:4 C:06 T:40 S:0000

This displays the number of lives remaining (L:), the number of jewels which must be collected to complete the cavern (C:), the time remaining in that cavern (T:) and your score (S:). You begin a game with 4 lives. A life is lost when you are squashed by an Amiga ball or when your time expires. You score 10 points for every jewel you collect. When you have collected enough jewels, an exit will appear which will let you enter the next cavern.

A countdown timer will bleep when the time remaining is close to running out. When all 7 caverns have been completed, you will start over again at the first level but things will have speeded up.

I hope that MAD doesn't drive you mad - get playing!

Listing on page 56

MAD

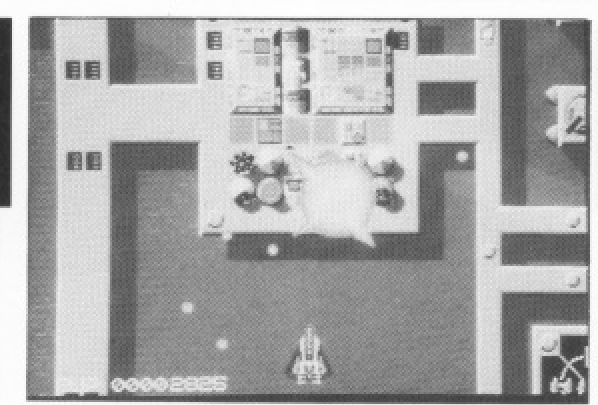
```
10    fullw 2: clearw 2: gotoxy 0,1
20    ? " **********************************************************************"
30    ? " *                                                                    *"
40    ? " *                             ST MAD                                 *"
50    ? " *                                                                    *"
60    ? " *                       Program by Paul Lay                          *"
70    ? " *                                                                    *"
80    ? " *                    Art by Harvey A. Kong Tin                       *"
90    ? " *                                                                    *"
100   ? " * ------------------------------------------------------------------ *"
110   ? " *                                                                    *"
120   ? " *            Page 6 Magazine (England), 23rd April 1988              *"
130   ? " *                                                                    *"
140   ? " **********************************************************************"
150   ?: ? " *** Insert destination diskette & hit any key";
160   key$=input$(1)
170   ?: ?: ? " *** Creating file 'a:\mad.prg'": ?
180   on error goto 350
190   open "R",#1,"a:\mad.prg",1
200   field #1,1 as byte$: rec%=1
210   on error goto 360
220   for line%=430 to 3510 step 10
230   ? " *** Line"; line%;: checksum%=0
240   read code$,total%
250   for index%=1 to len(code$) step 2
260   digit$=mid$(code$,index%,1): gosub convert: hi%=digit%
270   digit$=mid$(code$,index%+1,1): gosub convert: lo%=digit%
280   value%=16*hi%+lo%: checksum%=checksum%+value%
290   lset byte$=chr$(value%)
300   put #1,rec%: rec%=rec%+1
310   next index%
320   if checksum%<>total% then goto 360
330   ? "okay": next index%
340   ?: ? " *** Created file okay": end
350   ? " *** Error opening file": end
360   ? "data error": end
370   convert:
380   digit%=-1
390   if digit$>="0" and digit$<="9" then digit%=asc(digit$)-asc("0")
400   if digit$>="A" and digit$<="F" then digit%=10+asc(digit$)-asc("A")
410   if digit$>="a" and digit$<="f" then digit%=10+asc(digit$)-asc("a")
420   return
430   data 601A0000200D20000000000000000000000000000000000000000000000,364
440   data 4FF90000512E61000452610006724 3F9000004F4610008746100067 6,1861
450   data 41F90007800043F90000183661000B7A41F90007BAB0227C000001BE,2054
460   data 610015D041F90007943243F9000001CE610015C041F90007DFAC43F9,2710
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SIDEWINDER
Mastertronic
£9.95

Reviewed by Damon Howarth



Once more the universe is under attack, the giant Starkiller is on course to rid us of our sun. Your task, should you volunteer for an almost certain suicide mission, is to destroy this scourge of the skies in your ubiquitous one man fighter.

The scenario is similar to many and the initial presentation is not too disimilar to Xenon without the speech. The music is not of the greatest quality and that of the loading screen is fortunately disengaged on the insertion of the second disk. Once the game is up and running and the player(s) have chosen between single or dual player mode things become slightly less mundane and a good shoot 'em up unfolds. The object of the game is to penetrate the massive ship and, by making your way through a variety of levels, explode the central core of the reactor. The screen scrolls vertically very smoothly and

'colourful, inventive and absorbing'

once you have exited the opening chute it becomes apparent that the game's name is derived from the fact that some limited sideways scrolling is in fact very necessary.

A bewildering array of spacecraft attempt to intercept you as does the automatic defence artillery and your laser guns take several hits to destroy ground objects although airborne foes tend to blow up in the one hit. The spot effects both aurally and visually are well above average for these events.

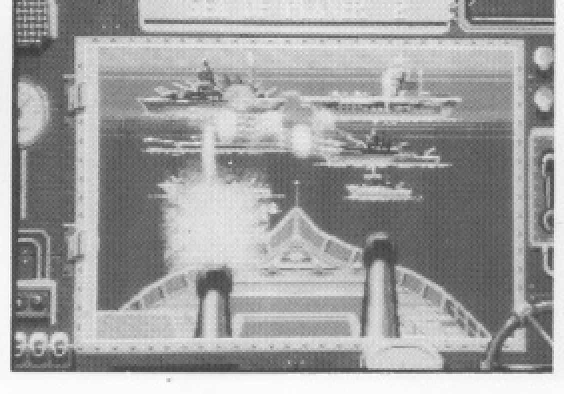
There are the mandatory power capsules to pick up on the way, which increase either durability of the ship or offer greatly enhanced firing capabilities. These prove very important and indeed vital at crucial points. Do beware of the hover 'pill' since it is a two edged weapon extremely handy for standing and blasting with but you then become a sitting duck for all 'seeking' weapons. The artwork of the various levels is colourful, inventive and absorbing with everything a good arcade size. The sprites loom large and are very well drawn as is your own ship, the verdancy of the hydroponics farm lends a suitable agraria air to the level.

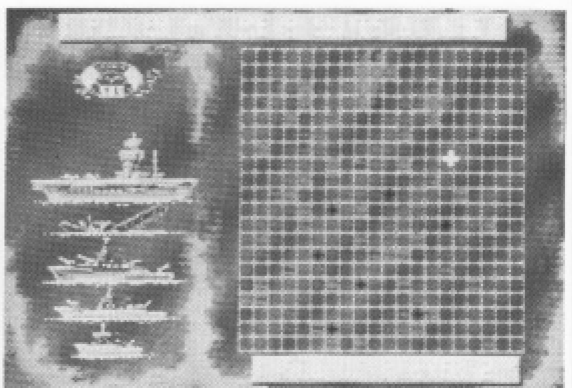
I found the game took a little getting used to and it did not have the immediate hook that Xenon had, but after a few runs I was hooked. The variability of the speed and the difficulty helped and soon I was feeling the 'just one more go' syndrome making the whole affair quite compulsive and addictive. There did not seem to be a high score table available - unless of course I did not manage to shoot myself into such elite company but considering that I did earn some bonus ships that would appear unlikely. This omission is disappointing as there is no indication as to the quality that is expected of the average player.

All in all this was a game I enjoyed, noisy, brash, exciting and fast. It is not quite Xenon but well worth the buying if scrolling arcade games are of any interest to you at all.

BATTLESHIPS
Elite
£19.95

Reviewed by John S Davison





Oh, no! Not a computerised version of the old favourite - Battleships? Hey, just a minute - don't skip the rest of the review, the program's really rather good! It's been brought right up to date with super animated graphics and sound, been given single, two player, and multi-player options and it has a very simple mouse driven interface, so even your Granny could play it!

Before each game starts you choose whether you want to fire salvoes of shots or single shots. Salvoes give you four shots for each of your ships still afloat, otherwise it's just one shot per turn. I recommend using salvoes, otherwise a game lasts forever.

The game begins with each player secretly hiding six ships in a 20 by 20 grid, these being a battleship, aircraft carrier, submarine, two destroyers, and a torpedo boat. Each type of ship is represented by a different shape and takes a different number of grid positions.

The players then take it in turns to locate and sink their opponent's ships. By clicking on the grid squares you mark them with crosses to identify them as gunfire targets. The squares all start out coloured blue, but they change colour later to indicate whether your shots hit or missed any of the hidden ships.

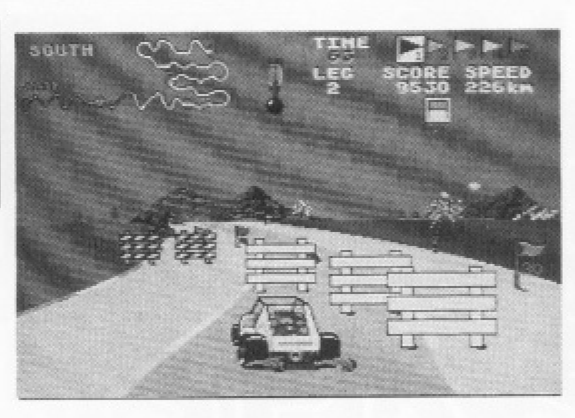
The screen then changes to a superb picture of the gunner's view from the gun turret, showing two huge gun barrels pointing at your opponent's fleet. Firing then commences, the guns recoiling realistically as smoke and flames belch from their muzzles with each shot fired. The animation of this is truly spectacular. You see the shells arcing away into the distance, and if your choice of grid squares was correct they hit one or more of your opponent's ships. With each hit, a ship shows more and more damage until it finally disappears beneath the waves.

Play then alternates between the two players until one of them wins by sinking all of his opponent's ships. He's then saluted by a musical fanfare and 'victory sail-past' of his fleet. But don't blink or you'll miss it - it lasts for all of five seconds.

I expected this game to be boring, but Elite have done a great job in computerising it. It really is quite playable, and offers the perfect antidote to the stress caused by too many hours of Carrier Command! The kids will love it. I'm almost ashamed to admit it, but I do too!

BUGGY BOY
Elite
£19.95

Reviewed by John Davison jnr





Having been extremely quiet on the ST software front for some time now, Elite have recently announced and released a number of titles, most of which are conversions of arcade games. Buggy Boy is one of these conversions, and is an excellent home version of the highly acclaimed Taito arcade machine.

The game, for those of you who have not seen it before, is basically a three dimensional racing game which is very similar in appearance to Pole Position. You view your buggy from behind and you see the road snaking off towards the horizon.

There are five courses which you can race, North, South, East, West and the supposedly easier Offroad course. Each of these courses not only has the basic road layout of other games of this type, but there are also many obstacles and pieces of scenery around. These include trees, boulders which must be avoided, gates, logs which can be jumped over, and tree stumps and small rocks which will flip your car up onto two wheels. You will also have to traverse narrow causeways across rivers and go through winding tunnels. Each course has five sections which must each be completed in a given time limit. You can extend your time slightly by picking up 'time flags' along the way which will each add two seconds onto your next time limit. To collect bonus points on your way along the tracks you can pick up coloured flags in a given order which will help bump up your score.

Buggy Boy is one of those games which 'grabs' you. Once you sit down to play, it is extremely difficult to stop yourself having 'just one more go'. I have not yet managed to complete all five stages of any one track, I've very nearly done it a number of times but I am still eager to go back and have another try. This sets Buggy Boy apart from many other games where, after so many goes when you can't do certain bits, you probably give up.

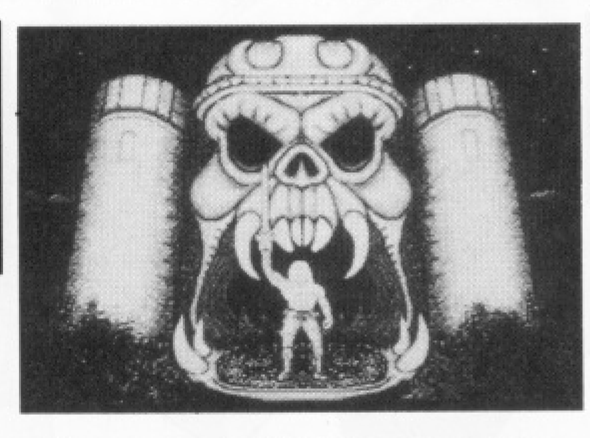
The graphics in Buggy Boy are truly brilliant, the speed at which the finely detailed objects move by is incredible. This speed is not given at the expense of the smoothness of the graphics either. The screen is very colourful and it is obvious that a lot of work has gone into making this game as close to its arcade counterpart as possible.

My only complaint is the sound. The engine in particular got on my nerves slightly, because when you are cruising along at top speed it never sounds quite 'right', never seeming to sound quite fast enough.

Overall Buggy Boy is a visually impressive game with bright, colourful graphics and it has an extremely addictive quality.

MASTERS OF THE UNIVERSE
Gremlin
£19.95

Reviewed by Ron Stewart



'a neat little game'

For many, older, ST users perhaps the ultimate embarrassment could be going into the local computer store and asking for a copy of Masters of the Universe, but force yourself and overcome your inhibitions because there is quite a neat little game here.

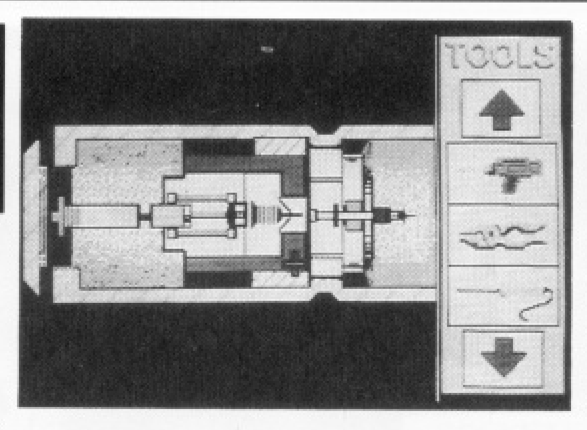
The scenario is that the cosmic key to time travel has found itself in the hands of a college student on modern day earth. He thinks that it is a musical instrument, and is totally unaware that every time he plays the key he attracts Skeletor and his forces of evil. With the key in their possession they can create chaos back in Eternia. Only you, as He-Man can stop them by finding the lost chords.

You have to find your way around the city and collect eight missing chords that activate the time key. In the streets of the city you will have to face Skeletor's troops and some funny flying gizmos. Judging by this game the evil one has more followers than Michael Jackson, however, you can shoot or bludgeon your way past them or just avoid them altogether. Finding your way about is a little difficult until you tie together the compass system on the screen. If you are walking north and come to an intersection you will not continue to walk in that direction if you carry on. Instead the screen dissolves and is re-oriented by ninety degrees.

Finding your location and direction of travel is also helped by pressing the space key which will give you an on screen map and your current location. This useful little feature is not mentioned in the instructions. Occasionally you will be helped by two companions who have located a couple of chords for you. In the scrapyard He-Man has to face three of Skeletors most evil henchmen in a hand to hand tussle. In the music store there is a 'Prohibition' style shootout where you have to guide a target and shoot the minions that appear in the windows. Finally, you will get to the rooftops where He-Man has to fight using his flying disk. If you are still up and running then you are faced with combing the streets to find the remaining chords. Find all eight and the end of the game is in sight. Your final confrontation will be with Skeletor himself in yet another subgame.

Once you get the hang of moving and navigating about the city, this game makes good entertainment with its games within a game concept. The graphics are to a high standard but the sound effects could have been better. It's difficult to see where this game has been pitched in the market place. Masters of the Universe itself is targetted at the pre-teens, yet the controls in this game could be puzzling to many of them. Perhaps a little more design thought could have made it more acceptable to everyone.

BOMB DISPOSAL
Classic Software
£19.95





Reviewed by Damon Howarth

The advertisements for this game include screen shots which are not for the squeamish but the internals of the game far exceed the garishness of the publicity. This is a simulation rather than a game, memories of the TV series Danger U.X.B. flood to mind and it is an experience that I found exhilarating.

The packaging of the game is low key without the garish compact disk box that accompanies so many games these days, the manual is basically computer generated and the whole thing looks very much home produced but this value of the game. Your object is to defuse various bombs each of which is presented in the manual with varying degrees of informative usefulness and it is important to study the manual fully before any operating begins. The graphics are superbly detailed with each bomb presented in (if the phrase is allowable in this context) exploded form. The cutaway pictures allow a menu strip of tools to be accessed and used on the relevant parts of the engine of destruction. The fact that the Ministry cannot differentiate between the mark of a bomb or on occasions even offer more than generic guidelines to the defusing procedure means that failure rates are high.

Patience is the key to this game, that and very steady nerves since every bomb has a time limit once defusing begins to fail in any part. The explosion is loud and a brilliant, if gory, piece of animation follows. The game is controlled via the mouse which acts as your fingers. A good mousemat is essential and some technical knowledge about tools is advisable. The actual game play is simple although the use of implements is not. In some respects a lot of luck is required, for example guessing the order of wire cutting to defuse even the first bomb. The classic sequence is listed in the book, but not all bombs are classics! This is possibly my main criticism as there is no save game facility so that after any failure it is back to bomb one again which makes progress frustrating and difficult.

There may be a lobby who would call this game somewhat tasteless both in its treatment of the bomb disposal experts and of life itself. I mention this not because I am one these people but to make those who might be offended aware and thus save them any distress. Bearing that thought in mind I can wholeheartedly recommend this game to anyone with the patience to try it. I do not suggest it if you are the sort of player who is happiest with quick fire arcade games and has no time for slower cognitive games.

Sadly there was no Judy Geeson included in the package otherwise it would have been just about perfect for me!

STOCK MARKET
Tynesoft
£19.95

Reviewed by Ron Stewart

In general, stock market games are usually number crunchers. They invariably only differ by the amount of randomness applied to the program and the top dressing in the form of graphics and facilities. Tynesoft's 'Stock Market' is no worse or better than most.

The game opens with a title screen and asks for the names of up to six aspiring yuppies. After the preliminaries are over the market opens. Each player takes it in turn to buy and sell shares. On this main menu screen are the names of twenty top companies such as Telecom, Jaguar and British Airways. Considering this game is based on the London exchange, the choice of some of the companies is a bit strange. Warner Communications, Mattel and Coca Cola are not quoted in London. After the company name there are six columns which give the previous and current prices of the stock, what you paid for it and how much profit you have made. The final column tells you how much stock in the company you own. At the bottom of the screen are the options.

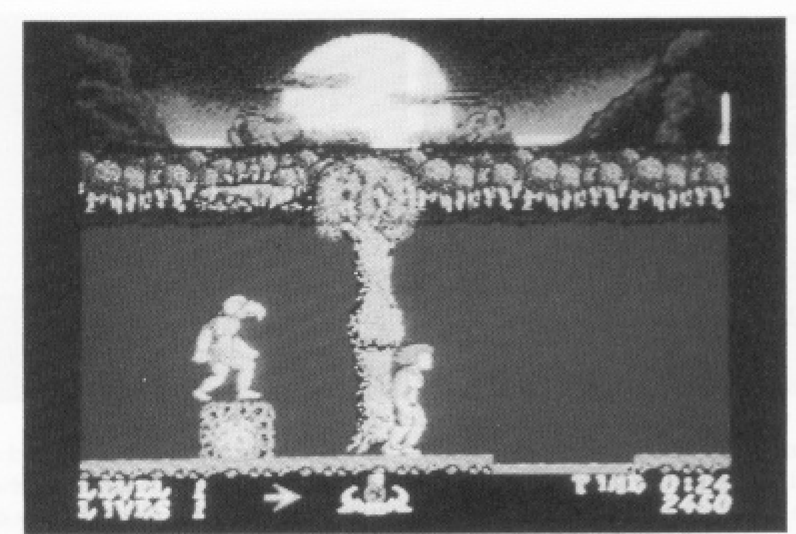
You can, of course, buy and sell. You can also get a money loan, take a look at your assets or see on a graph how a particular company's shares have fared. One of the games biggest failings is here. Deciding on which share to buy is a very hit or miss affair. No information is given as to outside influences that could affect the price of the shares. Tynesoft recommend keeping your share ownership down to six companies and they are probably right. The best strategy I found was to visit the bank and borrow as much money as I was allowed. If you buy shares in large amounts you can affect the price of the shares for the following players. Playing solitaire this is not possible. It would have been nice if some computer run players were available, but, alas, they are not.

After the share dealing is completed the computer randomly decides whether it is a 'Bull' or 'Bear' market. From here it chooses which shares will rise or fall in price and by how much. With a view of the exchange floor in the background, a ticker tape shows any news and any companies that might be affected by that news. This random change in share price is added or subtracted to the previous random change. The news does not appear to alter how the price changes next turn. Dividends are also handed out and once again this would appear to be random. From here you will return to the transaction screen.

It is a pity that the game rests so much on the vagaries of the computer. This simulation would have been improved tremendously if outside influences were announced on one turn which altered share prices on the next. Stock Exchange definitely improves when playing with three or four people but there is no real interaction for the solo player. Still, it makes an interesting change from scrolling shoot 'em ups!

THUNDERCATS
Elite
£19.95

Reviewed by Damon Howarth



Goodo!, I thought on seeing this game, one of my favourite TV cartoons to investigate. Trusting that its 8-bit origins would not be too evident I extracted the disk. 'Thunder! Thunder! Thundercats!' the cry of Lion-o echoed in my mind as I started to load this horizontal scrolling game.

A well drawn title screen greeted me as the disk busily whirred to confront me with a no less convincing picture of the evil Mum-Ra, a press of the fire button and ... disappointment. The background artwork was good but the Lion-o sprite was somewhat anonymous and, while prepared to search for the Stone of Omens and the other Thundercats, I had not been forewarned that the hero's face had also been stolen! The gameplay matched this initial reaction, technically the mechanics were good, the scrolling impeccable and joystick response positive but the feel of the game is somewhat characterless and lacking in general excitement.

It is perhaps an unfortunate fact that many companies are using licence deals to enhance otherwise barely adequate products, but this game does at least present an acceptable combat game, although without a great deal of variety in sword stroke or stance. The opponents appear to have escaped from Mum-Ra's circus with midget lions and bi-pedal buzzards as the first opponents. The object of the game, to delve deep into the many levels and find the lost magical stone and the captured comrades, sounds reasonable and even the level by level scoring system is effective in offering some short term goals but I found it less than gripping. While I accept that the backdrops to this search are at times extremely impressive with some excellent pictures of an all encompassing Mum-Ra in the sky, I do not think that this makes up for the unimaginative handling of the subject. My major criticism of the game is the extreme individuality of Lion-o. The secret of Thundercats (the cartoon) is the fact that it relies heavily on the team effort of the cats to overcome difficulties.

Because I felt I was being possibly unfair I showed the game to a seven year old friend of mine, who is a Thundercats addict, and she was totally underwhelmed by the whole affair. The one question she asked was "Where were the Thundercats?" then she went to watch her Lion-o video. I think that sums up the whole game!

THE UNINVITED
ICOM Simulations
Mirrorsoft
£24.95

Reviewed by Damon Howarth



The very title of this piece of software conveys the doom ridden gothic atmosphere which pervades the game. Shades of Lovecraft, Poe and King stare down upon the house to which you have not been invited.

The packaging, which is similar to that of Balance of Power, comes in the form of a hard backed book which doubles as disk holder and instruction manual. The tone of the book is a cross between Vincent Price and Rocky Horror, a form of supernatural levity and gallows humour which may not endear it to those of a delicate disposition. I was impressed to note that there are instructions to optimise dual disk drive capabilities as the game could be irritatingly full of change disk messages for single drive owners.

The loading screens are full of foreboding and good doom-laden colouring. Although the house would seem to be the standard Arkham house of Lovecraft it has been situated by Loch Ness. Your object is to enter the house, find your brother, and phone for a taxi since, as in all good horror stories, your car is inoperable following a crash.

The controls to this adventure are through GEM, by clicking on various items you can move, open, examine and operate them at will. It is this use of detailed GEM compatible art and menu bar commands that makes the game novel. In the first place the artwork has to be detailed since there is no descriptive narrative until the object is clicked on by the user. Some descriptions are lightly humorous others are downright blood-curdling and, coupled with the use of sampled sound effects, an altogether Hammer atmosphere exudes from the monitor screen.

'downright blood-curdling'

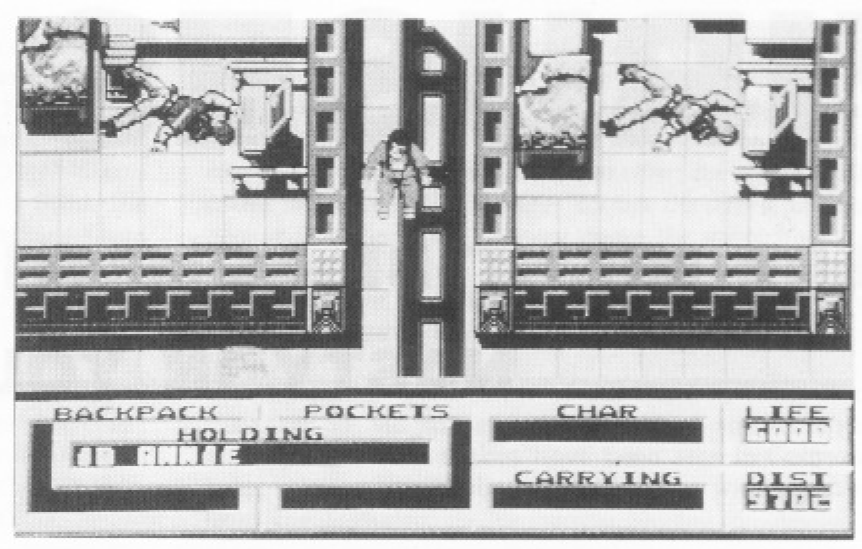
There is an ease of 'getting' or 'dropping' items that I have never experienced before, since each person, container or room has its own inventory window and moving objects is simply a matter of dragging things around and dropping them in the appropriate window. The ability to manipulate objects on screen can give the most entertaining effects, try for example running round in the wheelchair, it will even hang off the ceiling! This is a novel approach to adventures, seen earlier in a game called Deja-Vu. I thoroughly applaud the system and think it must be what the window system and GEM were written for.

My only warning to those considering the purchase is that some of the graphics are horrific skeletal heads and zombies abound. There is a strong supposition that players are aware of the nuances of the supernatural and so some background reading is recommended to the neophyte.

All in all a ripping good adventure with laughs and chills in fairly even mix.

PANDORA
Firebird
£19.95

Reviewed by John Davison jnr



Pandora is basically an arcade adventure, with very colourful graphics, set on a spaceship. You play the part of an 'Intergalactic Salvage Operator' who has boarded the two hundred year old spacecraft 'Pandora'. Your mission is to investigate the craft and collect artefacts which must eventually be returned to Earth for analysis.

The playing area is a scrolling birds-eye view of the large spacecraft, containing various rooms and characters who are moving about (or lying dead in some cases). You move your fairly large character around the craft using the joystick, and when you encounter objects or other characters you can interact with them. For example you will come across a professor who wants something to read. If you give him the Shakespeare which can be found elsewhere you will be presented with a syringe which can be given to a diabetic who you will also find on your travels.

Scattered around the craft are various dead bodies of crew and staff. If you stand over these characters and press the spacebar you will be shown what they are carrying and you can relieve the corpse of some objects and place them in your pockets or backpack. Useful objects which can be found include weapons and identification. The ID's are especially useful as they can get you in and out of various areas and also out of fights with guards and other characters (providing you are carrying the right one).

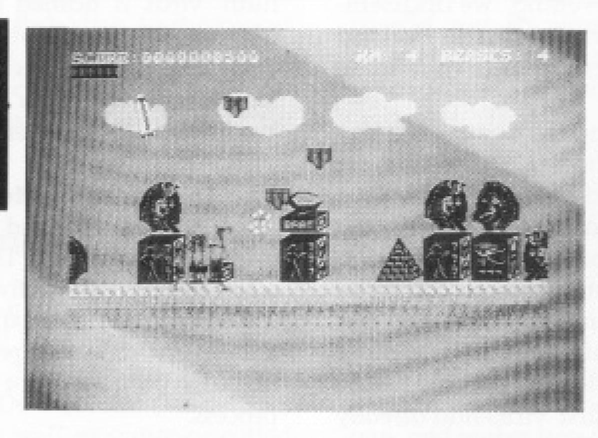
The fight scenes are especially amusing in this game. For example there is one character who is a real pain - the 'hooligan' who roams around abusing everything in sight. If by any chance you happen to bump into him you will have to attempt to beat him in a fight. The fight is depicted in cartoon fashion with a large cloud of dust with fists and feet occasionally popping out and words such as 'Biff' and 'Splat' appearing in true Batman fashion.

The game itself is, graphically, very cartoon like. The backgrounds and sprites are all very bright and colourful and reasonably well animated. My main complaint about the graphics is the scrolling which could quite easily have been made better. The sound is not especially impressive, but like most games it is adequate.

Overall Pandora is an enjoyable and amusing game which is quite addictive once you have got into it.

REVENGE II
Mastertronic
£9.95

Reviewed by John Davison jnr



Revenge II is the most recent release from Mastertronic, and also the first title to appear from Jeff Minter since the release of Colourspace.

Revenge II, as you can probably guess from the title is a sequel to a previous 'Revenge' game, and as often happens with ST games this first title is not available for our computers. Revenge II is, in fact the third in a series of games which started off with Attack of the Mutant Camels all those years ago on the Commodore 64 and later on the 8-bit Atari micros.

The story of the Mutant Camels is a long and complicated one, and those of you who know anything of Jeff Minter's sense of humour will have a good idea on how the story is made up. To find out the history of the beasts you must read the story on the instruction sheet of the game, which is hilarious. Basically what is happening in this episode of the 'Camels' is that they have been awakened from suspended animation on the dark side of the moon and must now help mankind again to drive away the attacking evil Zzyaxian empire.

Revenge II is a fairly typical Jeff Minter game involving you controlling a large camel and the general idea is to shoot anything that moves, and if it doesn't move, you might as well shoot at it anyway! There are many different waves which can be played all having various different attackers. The Zzyaxians sure have a wild imagination when it comes to things hell bent on destroying you. I have so far been attacked by toothbrushes, toothpaste, credit cards, telephones and telephone boxes, Amiga disks, cats, cassettes, cups of tea, cans of coke and glasses of Guinness along with many others! Each of these sprites is very colourful and moves smoothly and mostly at incredibly speed.

To destroy the rather odd adversaries you have a variety of weapons to choose from on the selection screen which appears between waves. If on the previous levels you have managed to win enough credits (by having energy left over at the end of a wave) you can buy any one of a variety of useful defences including - shields, yoyo bullets which return when they hit a target, smart bullets and big bullets. You could alternatively decide to opt for buying an extra 'beastie' (extra life) or if you feel the need you can buy extra energy for your existing camel. Once you have selected a weapon you can decide where you want to move to next by moving what is described as a 'selector thingie' over a grid. Each position on the grid contains different scenarios with different meanies.

The graphics are bright and flashy and the horizontal scrolling perfectly smooth. The sound is not particularly impressive but passable. Overall, Revenge II is an amusing game on which to let loose any violent feelings but I did find that you have to be in the right mood to play and also that I couldn't play it for extended periods without becoming slightly bored.

VIRUSES

THERE MIGHT BE SOMETHING NASTY IN YOUR ST!

Richard Karsmakers, founder of the disk magazine ST News, discusses known viruses on the ST

Sunday, November 22nd, 1987, the telephone rang. I turned down the volume of my amplifier - who the hell had the nerve to call me at this utterly unholy hour - and picked up the phone. Hardly had I put the phone to my ear when an obviously quite excited bloke (hi Klaus!) started talking about a phenomenon quite unknown to me as an ST user - computer viruses! Of course I had heard something about them already, since Amiga users all over Holland had been troubled by these computerological nasties for months now. But now a computer virus also seemed to have appeared on our much beloved Atari ST, or so Klaus stated. He even went as far as telling me that he had found viruses on some of my disks he had received earlier, and that all my disks at home would probably be infected! Since my eyes were already experiencing some trouble staying open, I went to bed and decided to examine my disks the coming morning.

Next morning I booted up a disk monitor and I became really concerned. Although Klaus seemed to have exaggerated a little, I still had over 10 infected disks! What now to do? Throw away the disks? One might say I started to panic a little, so I contacted my good friend Frank Lemmen and told him everything I had learned till now. That historical Sunday evening, we disassembled the virus and Frank made the first virus killer in Holland that was to be uploaded to several Bulletin Boards that same night.

After that, everything went very fast. I phoned about everyone I knew and warned them that the ultimate Armageddon for Atari ST users had started. The viruses had landed! After a little while many newspapers, computer magazines and even the television started giving attention to computer viruses. Through the PD disk magazine "ST News" the first articles about computer viruses appeared in the middle of December and slowly but surely many a computer user was warned against computer viruses - especially on the ST. Many people now became aware of the virus, and it turned out that this first virus had already spread itself to countries as far as England, Greece, New Zealand, Denmark and the United States. But the countries where the virus turned out to be found the most were Holland and Germany.

KNOWN VIRUSES

During the course of many conversations I discovered that there was not just one virus but several and those known to date are as follows.

The Signum Virus: Discovered on November 22nd 1987, after having received a phone call from Klaus Seligmann. This is the most commonly spread virus, and has been found in countries as far as Greece, England, New Zealand and the United States. It's most evidently present in Holland and West Germany, however. This is the virus that was to be found on several original program disks(!) like GfA Systemtechnik's 'GfA Basic 3.0 Buch' and G-Data's 'GEM Retrace Recorder'. It merely copies itself to other disks, and then waits for a certain code to be found on the other disk - the second step will then become active, which is not yet found but which might be dangerous! It is multiplied whenever a directory from a disk is read or a disk is formatted with an infected system. Rumours are going around that this virus was developed by the people of Proficomp (creators of 'Aladin) to intercept and destroy illegal versions of their MacIntosh enhancer (just rumours). The 'Signum' virus is named thus because it was said to be found on a 'Signum' (Application Systems, Heidelberg, West Germany) disk first. Purchasers of current copies of commercial software should not worry as the publishers will almost certainly have eradicated the problem by now.

The Fun Virus or Mad Virus: Discovered on March 16th 1988, after having received a disk that Eerk Hofmeester of 'STRIKE-a-LIGHT' suspected. This virus copies itself to other disks, and when it has done so five times, it starts doing strange things with the screen and the soundchip (making noise and flipping screen, etc.) every time a directory is read. Quite harmless - it may only actually damage data present in the bootsector in the copying process.

The Busted Bios Parameter Block Virus: Which I received from Mr. Anton Raves from Compudress in Kamerik, Holland (thanks, Anton!), who discovered it. In fact, this is a slightly adapted version of the 'Signum' virus, but one which has some additional code (checking the ALT-key?!) written over the disk's format parameters. A disk that is infected by this virus is unreadable but can still be repaired by the 'Virus Destruction Utility' versions 3.1 and up.

The ACA Virus: This is the fourth known boot-sector virus. This is the most dangerous bootsector virus I have ever seen, as it clears the entire first track (FAT and bootsector) of a disk when it becomes active! It was actually sent to me by someone calling himself Little Joe (from Sweden) and I received it on June 29th, 1988. The virus is written by a Swedish group called 'ACA', and the phone number of the virus creator is (Sweden) 0300/63350 (so let's all phone him - and you needn't refrain yourself from swearing and cursing!!). I have heard that they are working on a virus that will be even worse, that can infect a hard disk as well (which would be the first!).

The Freeze Virus: This is a largely adapted version of the 'Mad Virus', which has different results and which was sent to me by the author of a German virus killer on July 12th 1988. As far as I have been able to see, this virus installs an interrupt that causes the system to freeze (to hang up, so that NOTHING can move any more) when a certain condition is true. I think the condition is that a disk with 11 sectors per track is inserted and the 11th sector is read or written to. Apart from multiplying itself, it does not appear to touch the disk so data is quite safe there.

The Screen Virus: This virus only works on German pre-blitter TOS machines, and is COMPLETELY HARMLESS when you don't have one of those machines (it even doesn't multiply itself then). I received it together with the 'Freeze Virus' from Carsten Frischkorn, author of the PD virus killer 'Antibiotikum'.

Milzbrand: The first known link-virus was 'Milzbrand', published in the German computer magazine 'Computer & Technik' as type-in listing! Author is Eckhard Krabel from Germany. The original virus checks the date stamp and when it's set to 1987, the disk's bootsector and FAT are cleared and the information on the disk is unreadable after that. In the boot sector, it writes: 'Dies ist ein Virus!'. Since the program was a type-in listing, everybody can adapt this virus to specific wishes. It's simply terrible!

'if the reports are true this means that there may now be twenty viruses existing'

Virus Construction Set: I have not yet been able to get my hands on this program, which allows the user to create standard or custom (link) viruses in a comfortable GEM environment. This program allows the stupidest nutcases to write a real dangerous virus! In the Austrian magazine 'XEST', I have been able to read something more about this virus. It's a link-virus that replaces part of the old program header by its own code. The 'Virus Construction Set' costs DM50, and can be ordered through Nightmare Software (Mr. Oliver Sturm). It was first launched on the 1988 CeBit.

ARE THERE MORE?

So much for viruses discovered so far, but are there others being developed? In a recent issue of 'ST Report' I read some interesting stuff about viruses in the United States. This contained a report of a modem conference with people like David Small (Magic Sac) and Timothy Purves (Michtron BBS), as well as someone called George Woodside who appeared to have some viruses in his possession that I had never heard of before. Let's quote some of his statements about these viruses...

"One virus I have here is too big to fit in a boot sector. It uses the extra FAT sector to extend itself. That way, a virus can have 2.5K (5 sectors) to fit into. This one uses ROM routines, hard coded, to extend itself even more. I can't tell all that it will do, since it uses routines in the European ROMS. It will, however, simulate hardware errors in an ST by illegal memory accesses after the system has been running for a while. It checks the system clock. With that much code space to play with, the thing could do anything, including wipe a hard disk very quickly. It could be spread, and launched, by floppies and look for hard disk systems. Then, bang, you have a clean HD. You'd never know where it came from."

"Another virus I've heard of, but don't have, does a slow (a few bytes at a time) corruption of the FATs on the floppies. You don't know it is corrupting your disks, until you start turning up bad files everywhere. That's the worst part - you never know what they will do."

"Another virus uses the elapsed timer in the BIOS reserved memory area. It is totally quiet until the system has run 3 hours. If it sees a non-infected disk, it spreads itself, and sets the elapsed timer back to 2:45. After 3:00, it starts another timer watch. Then, at random intervals, it does a memory write to either the screen RAM or memory above the screen. It will either corrupt the screen, or cause bombs to appear from accessing memory above the screen area. I've discussed these viruses with Atari, and we've agreed to make all we have learned public. We feel that the virus writers already know what they are doing, so we need to inform the users."

Tarik Ahmia, chief editor of the German computer magazine '68000er: ST Magazine', recently told me something more about several other viruses that have been seen in Germany, but that I don't know much about yet (just like with the above viruses from the States):

"One bootsector virus checks for the system date. When it is 1987, it deletes the FATs of both your floppy disks and your hard disk. This means that the data on those disks are irretrievably lost! It was published in the most recent issue of the German magazine Computer & Technik - the same magazine that also published the 'Milzbrand' link-virus!! There are three additional variations of this virus, that check your directory for files of programs written by G-Data, Application Systems and GfA Systemtechnik respectively. When found, they are deleted from the disk."

"Another bootsector virus checks if there are any data files (only data files) present on the disk. When such is the case, these are deleted."

"The next bootsector virus allegedly succeeds in blowing up(!!) the parallel port on certain machines. The probability of this being true, however, is very small and it sounds really weird. The condition on which this will happen is not known to me."

"The last bootsector virus I know waits for the date to become December 31st 1988. When this has happened, it will repeatedly knock the hard disk read/write head to the last track until it is destroyed. This may sound improbable, but it's possible to get the read/write head out of alignment this way on a floppy drive, too!"

"The last two viruses I heard of are a link-virus and a substitute virus. The link-virus only merges itself to '1st Word Plus' and starts randomly destroying your documents. The substitute-virus modifies the program and makes sure the file length does not change (with link-viruses, file sizes become bigger). It waits until it has copied itself seven times, and when this has happened it causes a system crash."

If the above reports are true this means that there may now be twenty viruses existing, of which the 'Signum' virus is the most widely spread. This means that the virus problem is growing rapidly; something HAS to be done to stop it!!

SOME POPULAR MYTHS

Fortunately there are programs available that will destroy viruses but first let's take a look at some of the myths that have sprung up.

IT WON'T HAPPEN TO ME. EVERYBODY can become the victim of a computer virus! This can happen through accidentally 'infected' original software (the salesman demonstrated the program on an infected computer system), using accidentally infected Public Domain software or using a disk in an

accidentally infected system at a user group or at a friend's. Several commercial program disks in Holland have already accidentally been supplied with a virus on them including an Omikron disk and GfA Basic 3.0 Buch Disk (not the actual GfA Basic version 3.0 disk!). So there's no bigger nonsense than to say 'Things like that don't happen to me ...'

IT'S THERE FOREVER. When you turn your computer off and on (for about 10 seconds, just to be sure), it is IMPOSSIBLE that a virus is left in your computer. Some people have said that a virus can nest itself in a computer's ROM. Well, unless there's a way to make 5 volts convert into 20 volts by software only and unless it's possible to create ultraviolet radiation by a couple of POKEs, this is COMPLETE NONSENSE! And didn't we learn that ROM meant 'Read Only Memory', in which it is impossible to write? Only on machines that have a piece of RAM memory permanently supplied with juice (e.g. the keyboard processor's RAM of the Amiga 2000 and the Atari MEGA ST), is it theoretically possible to store a virus permanently, although the MEGA ST's keyboard processor (that is battery-backed) only has 128 bytes of usable RAM. Removing and re-inserting the batteries will help, but don't fear, such a virus does not even exist on the ST.

YOU CAN'T PROTECT YOUR DISK. Not one virus on the ST can ignore the write-protect notch, so if you keep your disks write-protected at all times, it is impossible to let them be infected by any virus! Unfortunately, some of the disks containing your most valuable data (work disks, source disks, games that save hiscores) are all, according to Murphy's Laws left unwrite-protected most of the time, and are thus the most vulnerable.

THROW IT AWAY. Some people, trying to sound interesting (like they know it all), have stated that there is but one remedy for an infected disk. Regardless of what it contains (e.g. a couple of thousand addresses of business associates or maybe all your program source material that only took you a couple of months to program), you must destroy it (throw it away, burn it, whatever). Of course, this is complete nonsense. Using a so-called 'Virus Killer' (a program that can recognise and destroy viruses), it is possible to restore infected disks without harming any of the other data present on it.

JUST FORMAT THE DISK: Formatting a disk does not always help, either. Apart from the fact that all data is irrecoverably lost when this is done, it is also a fact that some viruses adapt the 'disk format' routine to their own use. The disk appears to be properly formatted, but is actually neatly supplied with a fresh copy of the virus. The only solution is, again, the 'Virus Killer'.

SOLVING THE PROBLEMS

So what can be done against viruses? In the first place, you should try to keep your disks write-protected as much as possible. This reduces the problem a lot, but unfortunately it still leaves Murphy's Laws active. The virus always strikes where it finds a non-write protected disk (containing your most valuable or important data), so that's why some people have written Virus Killers which were already hinted at earlier. There are about half a dozen of these virus killers in the public domain but all have their specific disadvantages. The first ones, written by Frank Lemmen from Holland, could only discover and annihilate the first virus. Others could only recognise 'executable bootsectors' which in only a couple percent of all cases actually indicates an actual virus, but there is now a virus killer that can destroy ALL known ST viruses - including the notorious link-virus that cannot be repaired by ANY of the other virus killer programs.

This virus killer is the Virus Destruction Utility version 3.1, designed and developed in Holland but written in English to make sure that many people can use it - for the virus problem is international. This 'Virus Destruction Utility' does not merely recognize and destroy all known ST viruses while leaving all other (harmless) data intact, it also recognizes a majority of other programs that use the bootsector so that these are not accidentally destroyed (examples of these packages being Firebird's 'Return to Genesis' and Microdeal's 'ST Soccer' to name two current releases). When such a program's bootsector already happens to have been destroyed by another virus killer (or perhaps one of the viruses itself, while multiplying itself to this sector), the Virus Destruction Utility also knows how to repair many of these. Immunizing one's disks is also possible, so that no boot-sector viruses are written on them any more without you even having to bother about keeping them write-protected (though this is often not possible by programs that actually use the boot-sector). The latter two options can save you a lot of trouble. And money, too. Details of how you can get the Virus Destruction Utility are given at the end of this article.

FINALLY ... A CALL TO ALL LUNATICS MAKING VIRUSES

There is no certainty with regard to the identity of people made the viruses on the ST, except for some of the link-viruses, which were programmed by Eckhard Krabel for 'Computer & Technik' magazine in Germany and Nightmare Software, also in Germany and the ACA bootsector virus. Data Becker has launched 'Das Grosse Virenbuch', a book that explains techniques on how to make viruses on the MS-DOS systems - which are also applicable in the ST to certain extent! Needless to say what is thought about such people! One thing that's sure is that all sides of the computer industry have joined in the struggle for survival against the computer viruses - software companies, hobby computer users, program authors, even crackers, so if you belong to one of those sick and utterly mentally deranged fanatics writing viruses, let yourself be advised to beware! Even better, don't write any more viruses - you'll only harm other people and eventually you will get harmed yourself as well. •

THE VIRUS DESTRUCTION UTILITY

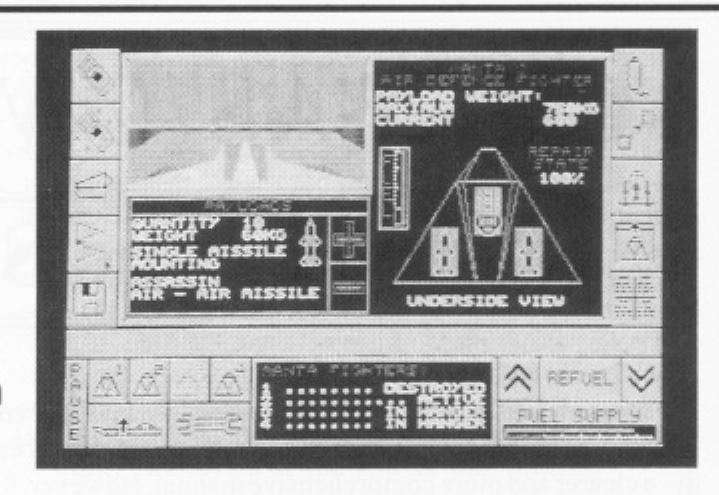
This utility has been programmed in Holland but is available to ST users in the UK. Copies can be obtained by transferring £6.95 to Barclay cheque account 80533408 in the name of J.P. Karsmakers Esq., Kievitstraat 50, 5702 LE Helmond, The Netherlands. Please specify 'Viruskiller, and don't forget to mention your name and address either. You will then receive the program mailed to your home as fast as possible. Registered users ('Virus Destruction Utility' versions 3.0 and higher are NOT Public Domain and may NOT be copied freely) will be able to use a regular update service. They will automatically be advised when an update is finished which they will then enable them to order at a reduced price (about a 50% discount).

THE VIRUS DESTRUCTION UTILITY V3.1 is a program to search and destroy viruses while leaving other data fully intact. Price £6,95, published by the ACC, publishers of the PD disk magazine 'ST News'.

The main features of the program are:

* Recognition of virtually all software that uses the disk's boot sector
* Recognition of all ST viruses known to me - both bootsector - and link viruses
* Option to repair previously damaged boot sector software
* All data on your disks remains 100% intact!
* Immunizing of disks against most known bootsector viruses
* Option to repair damaged Bios Parameter Blocks
* Automatic recognition of any hard-floppy-and RAMdisks attached
* Instantaneous recognition of all known viruses already present in the computer system

CARRIER COMMAND



Reviewed byJohn S Davison

Occasionally, amongst the mass of new ST releases, one program stands out from the rest, eventually acquiring a cult following and classic status. Carrier Command, with its superb blend of strategy and arcade action and spectacular graphics, is one such program.

In essence, the game revolves around the land, sea, and air battles for control of an island archipelago. You are pitched against an enemy (controlled by the computer) who, like you, has an advanced technology Carrier fully equipped for taking the islands. To win you have to destroy the enemy Carrier, but this can only be done by occupying and advancing through strategically important islands, and setting up supply routes to support your campaign. Each Carrier has a complement of Manta aircraft and Walrus amphibious tanks, each with a wide range of weapons and systems to help dispose of the opposition and capture the islands.

NAVIGATE THE CARRIER

To occupy an island, you first have to navigate your Carrier to it and anchor in the shallow water near its coast. This can take up to ten minutes or so of real time, during which you have nothing much to do. At first this delay is annoying, but as the game progresses you may be glad of such breathing spaces to analyse the situation map and plan your next moves.

You then equip a Walrus with an appropriate Automatic Control Centre Builder (ACCB), launch it, and pilot it through the shallows, up the beach and drop your ACCB at a suitable spot. The ACCB then takes control of the island and before your very eyes automatically constructs buildings and other features necessary to transform the island into one of three types. These are Resource island, which mines raw materials; Factory island, which uses the raw materials to manufacture equipment and refine fuel for the Carrier's forces and Defence island, which provides defence for the area and landing/ refuelling facilities for your Manta aircraft.

You also have a Base island, which is your starting point. It's also initially your Stockpile island, to which weaponry, fuel, and other equipment manufactured by your Factory islands are shipped. Your Carrier's supplies can only be replenished from here, so as you progress through the archipelago you move your Stockpile to the other islands to ensure you're always within easy reach of it.

Factory islands have to be fed with raw materials from Resource islands, and the whole lot has to be networked together to ensure the right supplies can get through to the right places. The enemy will try to cut these supply lines, so the network has to be defended by strategically located Defence islands.

INTO BATTLE

If the enemy is already on an island you'll need to launch suitably armed Mantas and Walruses to destroy his aircraft, land based defences and Command Centre. Alternatively, you could employ the Carrier's own laser weapons or guided missiles, although these are only useful against ground targets. With the Command Centre dealt with, you can send in a Walrus equipped with an ACCB to take over the island.

The enemy forces can be tough nuts to crack, so you have to be sure you've equipped the Walrus and Manta vehicles with appropriate weapons from the wide range available. Get it wrong and they soon end up as useless, twisted wrecks. The Carrier itself can also come under attack and you need to deploy its defensive systems to combat serious threats. Should the Carrier, Mantas, or Walruses get damaged (rather than destroyed) the Carrier's damage control system will repair them according to the priorities you set.

As your campaign progresses you use up fuel, ACCB's, and munitions (and probably Mantas and Walruses too), so you have to ensure your factories produce enough replacement supplies to enable you to continue. You decide the relative manufacturing priorities of each item type - miscalculate and you'll find you're out of critical items when you need them most.

While all this is going on the enemy Carrier is also advancing, but starting from the opposite end of the archipelago. As you can imagine, there's vast scope for experimenting with different strategies to ensure the final outcome is in your favour. This, coupled with the game's arcade style battle action plus its simulation aspects, should provide lasting appeal.

It could take a long time to complete a game, so save and restore facilities are provided. Also, you can skip the strategic phase of the game and opt to start at the point where the islands are already occupied. This puts you into the battle action straight away with none of the strategic buildup.

STUNNING GRAPHICS

Visually, the game is stunning, especially the 'remote camera' views you get when you assume control of the Carrier, Walrus, or Manta. Spectacular three-dimensional, colour filled graphics are used to great effect, and the animation is fast and smooth and a joy to watch. I also liked the way the view changes to show external action in different parts of the Carrier as it happens, such as Manta take-off/landing and Walrus launch/ docking.

Sound, although not brilliant, is quite well done - particularly the whine of the Mantas' engines. There's also about 45 seconds of digitised music at the start of the game,, A extended version of which is supplied on a stereo musicassette as part of the package.

Control is by mouse or joystick, via a large number of icons. It's not always obvious what the icons mean and it took several hours of practice before I really got the hang of things. It's NOT a game you can sit down and play immediately.

Overall, Carrier Command is a knockout and is bound to become a classic on the ST. It's one of those programs that should be in everyone's software collection, so put it on your shopping list immediately. You won't be disappointed if you like games with long lasting appeal.

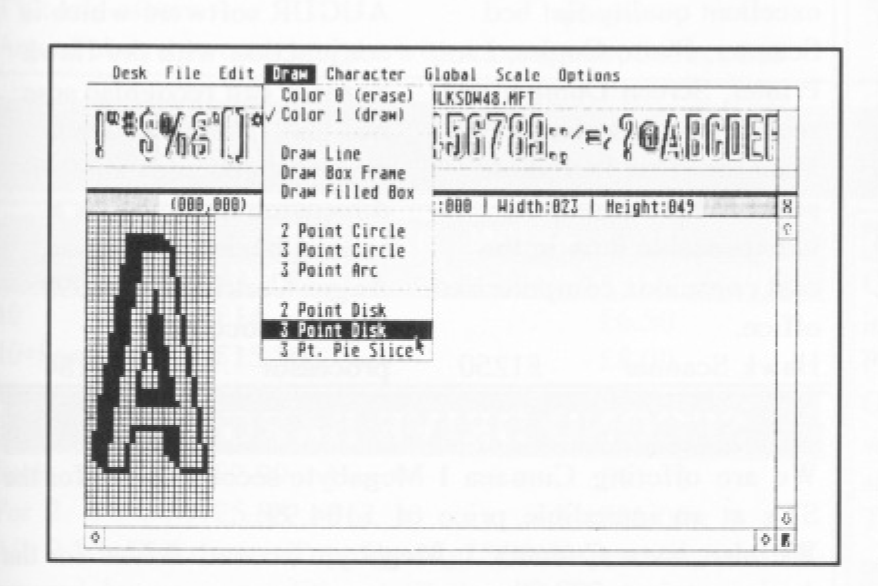
Carrier Command
Rainbird
£24.95

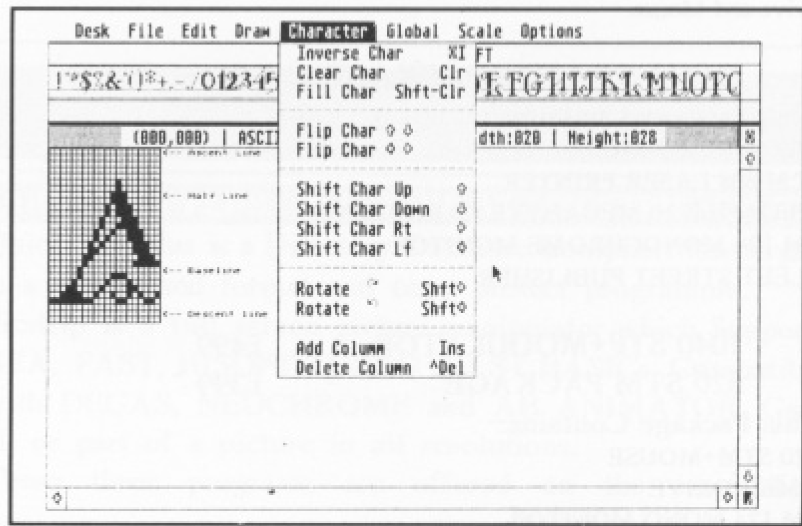
FONTZ!

published by Neocept

Reviewed by Matthew Jones

Could this be the font utility ST programmers have been waiting for?





Some time ago, I reviewed the JackFont font editor by Vogler, and gave it a thumbs up as a good font editor and because it was the only program around to do the job. Fontz!, from Neocept (formerly Neotron), is now available, and is very hot competition. In nearly every respect Fontz! is better than JackFont.

The purpose of Fontz! is to allow you to edit fonts for use with GDOS. GDOS is a small program which GEM needs to display alternative fonts, and is used by more and more programs now for font support (including Easy Draw, Superbase, and Wordup). Fontz! allows the creation of entirely new fonts, the editing of existing fonts, and the conversion of existing fonts to new sizes. It also allows you to convert fonts of non-GEM format to GDOS fonts.

Fontz! comes in a colourful box, and includes an 86 page booklet style manual, which is packed with relevant information. It includes an introduction to the program, and then swings straight into how to load the different fonts formats that it can handle. Fontz! can read fonts in the following formats - GEM, Hippo Word, Macintosh, Amiga and Degas. By being able to read each of these font types, Neocept hope that the number of fonts for the Atari will increase rapidly (watch out for copyright though). Fontz! can save in either GEM format or Paintworks format (very similar to GEM). As well as the options in the menus, and the operation of the program in general, the manual includes a large amount of information and advice on various aspects of converting and using fonts, including material such as the font file naming conventions.

In use, the program displays two windows, and a large menu bar. The top window displays a range of the characters in the font in a single line, and can be scrolled to view and select them for editing. The lower window is used for actually editing the character. The left button of the mouse sets a pixel, the right clears it. All sorts of alterations can be done to the character being edited. You can flip it horizontally or vertically, rotate, shift, invert, fill, clear, and add or delete a column of pixels. Nothing special? How about line draw, box draw, filled box, two circles and one arc, with circle fill and pie slice versions? You can cut, copy, paste and merge characters and blocks (areas of the characters).

The tools for editing the individual characters are very powerful (and useful when dealing with laser fonts), but Fontz! also allows editing of all the usual GEM font attributes, such as the ascent line, id number, point size, light mask, etc. It also (safely) adds more information to the header, in the form of device specific information, so that it can determine point size errors. In addition to these basic capabilities, Fontz! will scale fonts to different sizes, devices and by a percentage. It sometimes takes a while, but it works well. Even the fact that a really large font is too big to fit in the edit window is not a problem, either scroll, or select the option to reduce the scale, and you're in business again. Another option allows you to view the settings of the font lines (ascent etc.). You can also get a list of the resolutions of the current GDOS devices. The option that is missing is the ability to view a version of the font with a special effect active, like skew.

If you are using GDOS with any program, then this is an ideal companion. Be warned that creating a new font from scratch is very time consuming, and not easy, but with the ability of Fontz! to load fonts from other systems, and then convert them to other sizes and devices (like your printer), this could be an easy way to get more variety in your documents. The manual also contains a lot of good information, and makes Fontz! a program for every programmers library.

Fontz! costs £24.95, and is marketed in the UK by HB Marketing Ltd, Brooklyn House, 22 The Green, West Drayton, Middlesex. UB7 7PQ. Telephone 0895 444433

Readers Write

JIM CAN'T FIX IT!

Many thanks for publishing an excellent magazine. I think it is by far the best Atari-dedicated magazine on the market. I have a problem with a 130XE which I think you could help with. I have for a while had problems loading from cassette or disk to my XE. It was a hit or miss affair for a while and then, one day, it went completely. All I got was device timeouts or the self-test screen when attempting to boot-up (it still outputs to cassette, disk and printer). This caused a large sense of humour failure as I use my machine a lot and there it was broken! I took it along to my local (German) stockist who scratched his head for a while and advised me to buy a new one, which I did (or rather the wife did - bless her!). Anyway, I spoke to some more Atarians from the 'BFG Atari Users Group' (plug-plug!) and one said "if you write to Page 6 one of their experts will give you a clue, and I'll fix it". So if you could help I'll be very grateful.

Cpl. V. Busby
Germany

Dunno. There's an honest answer for you. I have not come across this type of problem before. Usually problems in loading, if you can still save, are attributable to the disk or cassette itself but in your case it must be the computer or it could be something as simple as a faulty I/O lead. If you have checked that all the connections on the I/O cable are good then it sounds as if it could be a fault in the POKEY chip and the only suggestion is to replace it, if you know what you are doing and can find another one. It may be worth just opening up the computer and pushing gently on all the chips to ensure that they have not worked loose. You would be surprised what miracles this can sometimes achieve! If any reader can throw more light on the problem I will happily pass the information on.

BEGINNING WITH A WORD PROCESSOR

Having read several comments in your excellent magazine I bought at the Atari show, your P.D.disk DS#8 Textpro, and now have a very good word processing system - 800XL, 1050 Drive and 1027 Printer. Textpro is very good as far as I can tell, never having used word processing before, which brings me to the point, the documentation whilst verbose is not really that helpful to people like me who know nothing about word processors. Full of tips for hackers on how to alter the program it does not have any form of tutorial at all. I have found many things by accidentally pressing the wrong key which sent me on a voyage of discovery. Would it be possible for you to run a tutorial on Textpro as you are doing for the wonderful Turbo Basic. There must be many like me who have bought it as a first word processor to test the water and need your guiding hand.

P.J.Smith

Is there an interest for this sort of article? That is one of the things we are trying to find out with the survey this issue. To me Textpro is very easy to use by just pressing the HELP key and taking it from there but I can see that someone who has not used a word processor before might find any such program daunting and the better the program the more confusing it gets! Unfortunately this type of problem can't be answered in a letters column through lack of space, but here's an opening for anyone who wants to write an article. How do you use word processors in general? What sort of things can they or can't they do? How about an example of compsoing a letter or other documnet and then giving a step by step guide on how you would go about getting it into shape for printing? There are several intersting areas in word processing and a well written article for the beginner to word processing would help a lot of other owners out.

CASSETTE LOADING PROBLEMS

Just after Christmas I obtained an Atari 65XE and an XC12 cassette unit. Since then I have obtained many games for it but I have been having difficulty loading them. I follow all the instructions on the card with the game and it still doesn't load. On my computer there is a built in self-test which runs tests on the memory, the keyboard and the audio-visual. When I'm loading games I always run the memory test, it is all working O.K. So then I load the game following the instructions and when it gets to about 30-40 on the tape counter the screen goes into self-test mode and the memory test flashes, so I run the test and it is perfectly O.K. Could you please tell me what it is that keeps making the computer go into this mode? If you can, could you please tell me a remedy?

S.J.Terry
Walsall

It is extremely unlikely that there is anything wrong with the computer itself. It sounds very much as though you have a recorder with the heads slightly out of line which is a fairly common problem. The heads can be realigned with specialist test equipment but this is generally only a job for a qualified Atari repairer. Your best bet is to take it back to the shop and ask them to exchange or repair it. If the heads are out of line then you should be able to CSAVE and CLOAD your own programs, but have difficulty in loading programs written and saved on other machines. Try writing a simple BASIC program and CSAVING it. If you can load it back in, and you still can't load your commercial games, the heads are almost certainly the problem.

TURBO BASIC

Please could you answer a few questions I have about TURBO BASIC? I should think that anyone with a disk drive would know about the AUTORUN.SYS created file which in turn loads and runs a Basic program. Well, can this be achieved using TURBO BASIC? Since the TURBO BASIC program itself adopts the AUTORUN.SYS filename, does the program, once loaded, look for another filename to indicate autoboot, such as AUTORUN-.TUR or something? When running a compiled program are you cut off from BASIC, etc.? If so can you re-enable it? Can you run other compiled programs without returning to the 'DOS-,Run oder Load:' prompt? Can you RUN any program? Can you BLOAD, BRUN, DIR., OPEN files, LIST or ENTER? Is there any decent literature on Mapping Turbo or on DE RE ATARI Turbo or even an XL/XE TURBO Handbook? Is that small 'guide', the bit of A5, all you can get? Thanks a lot for taking the time to read this somewhat larger than usual letter, I know they are rarely printed, especially handwritten and full of spelling mistakes. I'd be very grateful for any help and I'm sure a lot of other people would benefit too.

Michael Davies
Abergavenny

Unfortunately, as with many public domain programs, documentation on Turbo Basic is sparse and the documentation you have is the only guide available in English. There are a few articles in German and they may or may not give you the answers you need. As you know we have a regular Turbo Basic column and I would gladly give over the page to anyone who could write a tutorial on Turbo Basic, perhaps covering some of the points you have raised. There are now thousands of users of Turbo Basic and someone must have discovered some secrets that they are not sharing, so how about getting out the word processor and throwing a bit of light on things?

WHERE ARE THE SHOPS?

This is my third time writing to you, I know you must get a lot of letters but could you please print this one? I have a question - just how many Atari shops are there in Dublin? We are also interested in computing here. I get my hardware from the only outlet I know - Peats, but I

would like to know that there are more outlets in Dublin even if Atari were to open a new one for our area it would be a help! P.S. Please thank Paul Lay for the brilliant machine code game in Issue 33.

Michael Thornton
Dublin

As far as I am aware, you have found the Atari shop in Dublin and you should not be too disappointed, at least you do have a shop supporting Atari unlike thousands of owners over here - you should try to find a shop in Central London! Unfortunately good Atari retailers are few and far between and always have been. Those such as Peats can be counted on your fingers. Just be thankful, patronise the shop, and commiserate with those less fortunate!

WHERE IS THE HARDWARE?

In the past many people have written and complained about the lack of software in the shops. Well founded I agree but there is a more worrying aspect to this - hardware invisibility! I recently wanted to purchase a 130XE after my 800XL suddenly died. No problem I thought, there's the Silicon Centre in Edinburgh less than 30 miles away, and they're specialists. Wrong! They're specialist alright but for 16-bit only. Put off more than a little I continued my search after looking at your Resource File. Livingston Computer Centre was the next closest. No luck. I tried Laskeys, Currys, Dixons, the 'yellow pages'. 15 phone calls later, mail order was the only option, until I got the phone number for a second hand machine.
If this is the 'boom' of Atari it must have been impossible before. How can anyone expect software for an invisible machine? Don't expect help from some stores, one of them when asked 'do you stock the Atari 130XE?', responded 'Maybe, what is it?'. Next time you are looking for software, look for a blank bit on the shelves. That's the Atari section - invisible software for the invisible machine!!

R.C.Goodfellow
Dunbar

1020 PRINTER SUPPLIES

I would like to take this opportunity to say what a great issue No.33 was. I've only read issues from late 1986 but I can certainly say that this is the best I've read so far. I thought that Dave T's Disco was EXCELLENT. I've listened to lots of music played in VBI's, but I've never heard anything like this before. When I ran the program I nearly fell off my chair!! I was so amazed that I went and grabbed my brother (a Spectrum owner!) and told him to come and listen to some amazing music. He gave a grin, and looked into the data recorder to try and find the tape I was playing it off! When he found no tape his face went blank, and said "well it's not bad" - typical Spectrum owner!
The section on printers was very interesting, but I would just like to mention what you said about the 1020 printer. I own a 1020 and it is a good little printer. You said that printer paper and pens are hard to get hold of, but I've never had any difficulty. Paper is available from Silica Shop at £2.95 for two long rolls (order CXA 4207). Pens are also available from Silica at £4.95 for 4. You can either have 4 black (order CXA 4206), or 4 rainbow - red, green, blue and black - (order CXA 4204). Tandy also sell pens (in 3 packs), but I can't seem to find them listed. I hope this will save people being put off buying a 1020.

Dean Garraghty
Doncaster

DOES THE EPSON DUMP WORK?

The issue of compatibility rears its ugly head again in Issue 32, this time between printers. I refer to the Graph Maker listing, I have an Epson RX80 printer, so I LOADed the program and ENTERed listing 2 for Epson compatibles, all I got from my printer was rubbish. If I did it right, does that mean that it will only work on a compatible printer and not the real thing? That aside, keep up the good work with the magazine, I subscribe to the other two pure Atari magazines that you can get in England, and Page 6 is far better that both the others put together.

R.Joyce
Gainsborough
Lincs

I hooked up an Epson RX100 (same model with a wider carriage), loaded up the Graph Maker listing, ENTERed Listing 2, prepared a graph and all I got from the printer was ... a screen dump of Graphics 8! It wasn't exactly the best screen dump I have ever seen but it was perfectly recognisable and it does work. This is another of those mysteries, as several other readers have had the same problem and I can't figure out why it should work on our system and not on yours. Having said that, you would probably be better advised to try and find an alternative screen dump routine, for whilst this one does work, it is not exactly of the highest quality. I had not seen it before, having been assured by someone else that it did work, and now wish we hadn't put it in! Sorry about that, some of them slip through!

HOW MANY N's IN 5k?

I was interested to read the letter from K. Crocker about the extraneous N's in the WHIST listing. Setting up variables instead of numbers does save memory although it may seem contradictory to make a program longer by using variables in order to save memory. Although it does initially take extra memory depending on the length of the name, thereafter each time a name is used it takes only 1 byte regardless of the length of name. Besides saving memory you have an added bonus in saving disk space. The extra 5K which would have been used in WHIST, had I not used the N's, would have taken an extra 40 sectors on disk! So it is worth using these variables even on shorter programs. Some of my programs are so long I really do run out of memory, so I have to make use of memory saving devices.

R.L.Howarth
Preston

USING THE NEW ST BASIC

I am writing with reference to the article you printed on ST graphics titled 'ST Secrets'. This article was of a very high standard, as were most of the other articles printed in your March/ April issue. However, you did omit one thing, in the ST Secrets section, you did cope with 'C','Assembly Language' and 'ST BASIC', the problem is that Atari are now issuing a program called 'Enhanced ST Basic', which is almost entirely compatible with the old ST BASIC - almost. The new version omits certain commands such as 'DEF SEG', which has been replaced with other commands, the 'Atari ST Basic Quick Reference Guide' tells us that any programs using the 'DEF SEG' command must be re-written, I would be much obliged if you could put myself and all other new STFM owners out of our misery and tell us what we should replace this command with, and how we should re-write your graphics program, which when ran with the old basic is very impressive. This is a cry for help, I have discovered that most magazines do not cater for the needs of the new owner using enhanced basic, maybe your magazine could prove itself better than the rest once again by helping out the new owners and telling us how to adapt programs listed in old ST BASIC.

David J.O'Neill
N.Ireland

Yet another chance for someone to write a short article!

Why not write to Readers Write to air your views on Atari or ask us for advice? Drop us a line to Readers Write, PAGE 6, P.O. Box 54, Stafford, ST16 1DR

THE SURVEY

Your chance play a part in the future of PAGE 6 by telling us what you would like to see in future issues

alternatively

your chance to WIN TEN BLANK DISKS IN A BOX for the price of a stamp and ticking a few boxes!
(ten forms will be drawn and there will therefore be TEN lucky winners)

Firstly, an apology for wasting a page of the magazine, but sometimes these things need to be done and, besides, some people like reading these things and ticking all those little boxes. Please take a little time and fill in the survey so that we have a clearer idea of what we need to do in the future to keep you happy - PAGE 6 may be your only lifeline to your Atari, especially if you are an 8-bit user, so a little time now will ensure your continued enjoyment.

You may photocopy the form or copy out the questions or even commit the ultimate sacrilege and rip the page out of the magazine (have you read what's on the back yet?).

Please send the form back to PAGE 6, P.O. BOX 54, STAFFORD, ST16 1DR.

1. What system do you have?

- ☐ **8-bit disk based**
- ☐ **8-bit cassette based**
- ☐ **ST**

2. Of the following features would you like to see more or less or have we got it about right?

	More	Less	Same
News	☐	☐	☐
Letters	☐	☐	☐
Type-in Games	☐	☐	☐
Type-in Utilities	☐	☐	☐
Short type-in demos	☐	☐	☐
Hardware reviews	☐	☐	☐
Adventure column	☐	☐	☐
Games reviews	☐	☐	☐
'Serious' reviews	☐	☐	☐
Programming articles	☐	☐	☐
Tutorials	☐	☐	☐
Hardware projects	☐	☐	☐
Turbo Basic	☐	☐	☐
Interviews	☐	☐	☐
First Steps	☐	☐	☐
Contact	☐	☐	☐

3. Given the problems of space in the magazine and the length of some programs would you like to see less type-in listings actually in the magazine and more available on disk only with the documentation in the magazine?

- ☐ **Keep most listings in the magazine**
- ☐ **Take listings out and put them on disk only**

4. What specific things would you like to see featured in future articles?

____

____

____

____

5. Given the current scarcity of new releases for the 8-bit what specific items of older software would you like to see reviewed in future issues?

____

____

____

____

6. Would you like to see a regular top twenty chart or something similar?

☐ **Yes** ☐ **No**

7. Some people are quite happy that PAGE 6 covers both 8-bit and ST but others are not. What would you like to see?

	More	Less	None
8-bit	☐	☐	☐
ST	☐	☐	☐

8. Do you read both sections of the magazine even if you only own one machine?

☐ **Yes** ☐ **No**

9. Would you like more details of items from the PAGE 6 ACCESSORY SHOP mentioned in the magazine (such as reviews of specific items)?

☐ **Yes** ☐ **No**

10. Would you be interested in a regular column reviewing or reporting public domain software?

☐ **Yes** ☐ **No**

11. If you are not a subscriber can you tell us why?

- ☐ **I do subscribe (have a pat on the head and skip to the next question)**
- ☐ **I just like the thrill of buying a copy in the shops**
- ☐ **I don't buy every copy**
- ☐ **I prefer not to pay in advance**

12. If you don't subscribe, would a money-saving special offer tempt you?

- ☐ **Quite likely**
- ☐ **Depends what it is**
- ☐ **Not really, if I made up my mind to subscribe I would anyway**

13. How many people read your copy of PAGE 6?

______

14. Would you like to see a survey like this in EVERY issue of PAGE 6?

☐ **Definitely not! (Only answer allowed)**

We don't really need your name and address but if you want to be in with a chance of winning 10 FREE DISKS you had better put your name and address below.

Name . . . .

Address . . . .

. . . .

. . . .

What sort of disks would you like? (If your form is drawn out of the hat, that is)

☐ Big black ones ☐ Little blue ones

Thank you for taking time to fill this in, it is much appreciated.

THE RESOURCE FILE

The Resource File is a service provided by PAGE 6 to help Atari owners find sources of information, help and supply. An entry in this feature does not necessarily imply any endorsement by PAGE 6. The retailers shown are those who are known to have supported Atari for some time but things change and readers are advised to check for themselves to ensure that the information is still current. We would ask any readers who find information to be inaccurate or out of date to let us know so that an entry may be amended or deleted.

RETAILERS

ATARI WORLD
15, Fennell Street
Manchester
M4 3DU
Tel. 061 834 4941

BRIGHTON COMPUTER EXCHANGE
2, Ann Street
Brighton
BN1 4GP
Tel. 0273 686650

CHIPS
53, Rugby Road
Worthing
Sussex
BN11 5NB

COMPUTER ADVENTURE WORLD
Bank Buildings
1A, Charing Cross
Birkenhead
L41 6EJ
Tel. 051 666 1132

COMPUTER CAVERN
21, Harris Arcade
Reading
Berks.
RG1 1DN
Tel. 0734 474768

COMPUTER CENTRE
174, High Street
Hornchurch
Essex
Tel. 04024 75613

GAMER
71 East Street
Brighton
Sussex
BN1 1HQ
Tel. 0273 728681

GLASGOW COMPUTER CENTRE
Virginia Galleries
33 Virginia Street
Glasgow
G1 1TU
Tel. 041 552 1522

HI-FI WESTERN LTD.
52, Cambrian Road
Newport
Gwent
Tel. 0633 62790

INTOTO
1, Heathcoat Street
Hockley
Notts.
NG1 3AF
Tel. 0602 410987

JENNINGS STORES
244 - 248, Hertford Road
Enfield
Middx
Tel. 01 804 1767

LADBROKE COMPUTING LTD.
33, Ormskirk Road
Preston
Lancs.
PR1 2QP
Tel. 0772 21474

LIVINGSTON COMPUTER CENTRE
17, The Mall
Craigshill Shopping Centre
Livingston
West Lothian
Tel. 0506 36978

MICRO-TRONICS
27a, Market Street
Tamworth
Staffs
Tel. 0827 51480

ONE STEP BEYOND LTD.
11a, Castle Meadow
Norwich
NR1 3DG
Tel. 0603 663796

PEATS ELECTRONICS
197, Parnell Street
Dublin 1
Ireland
Tel. 0001 727799

SILICON CENTRE
7, Antigua Street
Edinburgh
Scotland
Tel. 031 557 4546

SOFTWARE EXPRESS
212, Broad Street
Birmingham
B15 2AY
Tel. 021 643 9100

SOFTWARE EXPRESS
9 Exeter Street
Plymouth
Devon
Tel. 0752 265276

A.S. WOOTTON & SON
116, Edleston Road
Crewe
CW2 7HD
Tel. 0270 214118

YORK COMPUTER CENTRE
9, Davygate Arcade
Davygate
York
YO1 2SU
Tel. 0904 641862

USER GROUPS

ABC
Contact Mike Donoghue, 135, St. Leonards Road, Leicester, LE2 3BZ. Tel. 0533 700190. Retailer and both 8-bit and ST user groups.

A.C.E. USER GROUP
Contact Martin Sharpe, 28, Brooklyn Court, Bradford Road, Cleckheaton, West Yorks, BD19 4TJ. Tel.0274 851131 (24 hours). Monthly meetings, newsletter, trips, discounts etc.

ATARI USER GROUP (IRELAND)
Contact 100, Silloge Avenue, Ballymum, Dublin 11, Ireland. Tel. Dublin 425918

BESTWOOD 8-BIT USER GROUP
Contact David Taylor, 60 Stevenholme Crescent, Bestwood Park, Nottingham, NG5 5JW. Tel. 0602 209735. 8-bit local users only

BOURNEMOUTH AND POOLE ATARI USER GROUP
Contact Colin Hunt. 248, Wimborne Road, Oakdale, Poole, Dorset. ST, 8-bit, hardware and software development.

BURY ST. EDMUNDS USERS GROUP
Contact Gary Brummage, 22, Ridley Road, Bury St. Edmunds, Suffolk, IP33 3HS. Please send SAE for details.

FaST (Fast ST Basic Users Group)
Contact Simon Rush, 42 York Road, Rayleigh, Essex, SS6 8SB. Tutorials in Basic and 68000. SAE for full details.

FLOPPYSHOP ST
Contact Steve Delaney, 50, Stewart Crescent, Northfield, Aberdeen, AB2 5SR. Tel. 0224 691824.

The GATEWAY CLUB
Contact Phil Herberer, 164d Radcliffe Road, Lakenheath, Suffolk. Tel. (Eriswell) 2363. All computer club with Atari section. Meets once a month.

LACE (LONDON ATARI COMPUTER ENTHUSIASTS)
Contact Glenn Leader, 143 Richmond Road, Leytonstone, London, E11 4BT. Tel. 01 556 0395. XL,XE, ST users. Great newsletter and PD library

LUG'S (LEEDS USER GROUP)
Contact Dave on 0532 717712 anytime. 1050, 810, cassette users welcome. Send SAE to P.O. Box TR7, Leeds, W. Yorks LS12 5PG

MACCLESFIELD COMPUTER CLUB
Contact Peter Solomon. Tel. 0625 20782 evenings and weekends. All computer club with Atari section. Meets fortnightly.

MERSEYSIDE ATARI CLUB
Contact Mike Lynch, 24, Oakdene Road, Anfield, Liverpool, Merseyside, L4 2SR. Tel 051 264 8435. ST ONLY. Regular meetings, newsletter and more.

NORTHERN ITALY ST FANS
Contact Carlo Bianchini, Viale Argonne 12, 27100 PAVIA, Italy

RAGE HARD A.U.G. (8-bit)
Contact Tony Longworth, 13, Greenfield Road, Little Sutton, South Wirral, Cheshire, L66 1PE. Tel. 051 339 0405. For 8-bit users everywhere. Send s.a.e. for details.

ROCHDALE ATARI COMPUTER ENTHUSIASTS (R.A.C.E.)
Contact The Secretary, P.O. Box 1, Rochdale, Lancs OL12 8TQ. SAE appreciated. All Ataris, meetings fortnightly

SIGATARI
Contact Glenn Leader, 143, Richmond Road, Leytonstone, London, E11 4BT. Tel 01 556 0395. For those interested in more unusual applications.

STARLIGHT ATARI CLUB
Contact Douglas Woodcock, 8, Ethnard Road, Peckham, London SE15 1RU. Tel. 01 639 3109 after 5 pm. Members with disk drives (8 bit).

ST CLUB
Contact Paul Glover, P.O. Box 20, Hertford, S13 8NN. Mail only(?). Worldwide.

VTB ATARI COMPUTER CLUB
Contact Christian Delabarre, Hekstraat 7, 9050 Evergem, Belgium. Tel. 091/26.29.29. For XI,XE,ST. Organised talks, visits etc.

WORLD ATARI PENPALS Int. User Group (WAP)
Contact Max Terveen, Magerhorst 8, Alphen a/d Rijn, 2402 LP, The Netherlands. Tel. 01720 45583. Members in USA, Canada, France, U.K., Greece, Germany, Saudi Arabia. Have circulating disk (8-bit and ST). Mail only.

Do you want others to know about your group? Send details as above ONLY (5 words max. on Members!) on a plain sheet of paper headed RESOURCE FILE - USER GROUPS. That's all you get! We will not publish any other details such as meeting times and places tend to change. Appoint someone responsible to handle any enquiries received.

BBS

Name: **GAMLINGAY TBBS**
Number: 0767 50511
Hours: 24 Hours
Baud: 300 - 2400
Features: Atari SIG and program library

Name: **THE VILLAGE**
Number: 01 464 2516
Hours: 24 Hours/7 days
Baud: V21, V22, V22BIS, V23
Features: 8 bit area, ST area, CP/M area

Name: **INFOMATIQUE**
Number: 0001 764942 (Dublin)
Hours: 24 Hours
Baud: 300/300 and 75/1000
Features: ATARI SIG and program library

Name: **CHARLY**
Number: 0451/31642 from Germany 010/49/451/31642 from England
Hours: 24 Hours/7 days
Baud: 300, 8n1
Features: Atari 8-bit and ST areas. P.D. software. Some German required!

Name: **THE ARK**
Number: 021 353 5486
Hours: 24 Hours/7 days
Baud: 300 or 1200/75
Features: 8 bit with Downloads, hints, swaps etc.

Name: **CRYSTAL TOWER BBS**
Number: 01 886 2813
Hours: 24 Hours
Baud: 300 to 2400
Features: Atari section which needs your support!

Name: **THE GNOME AT HOME**
Number: 01 888 8894
Hours: 24 Hours/7 days
Baud: V23 viewdata
Features: ST area frame *1632.0#. ST Babble starts on frame *1632.9#

Name: **CBABBS**
Number: 021 430 3761
Hours: 24 Hours/closed Thursdays
Baud: 300
Features: ST/8 bit, Email to USA and Canada

Name: **LEICESTER CENTRAL**
Number: 0533 700914
Hours: 24 Hours
Baud: 300 and 1200/75
Features: 8 bit area and ST area

PAGE 6 reserves the right to delete any entry from this feature for any reason. Inclusion does not imply any endorsement by PAGE 6 and PAGE 6 can accept no responsibility for the accuracy or completeness of an entry. Please tell us if you find any entry out of date.